United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with United States Department of the Interior, National Park Service; Washington State University, Agricultural Experiment Station; Island County; and Whidbey Island and Snohomish Conservation Districts

Soil Survey of Island County, Washington

How to Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

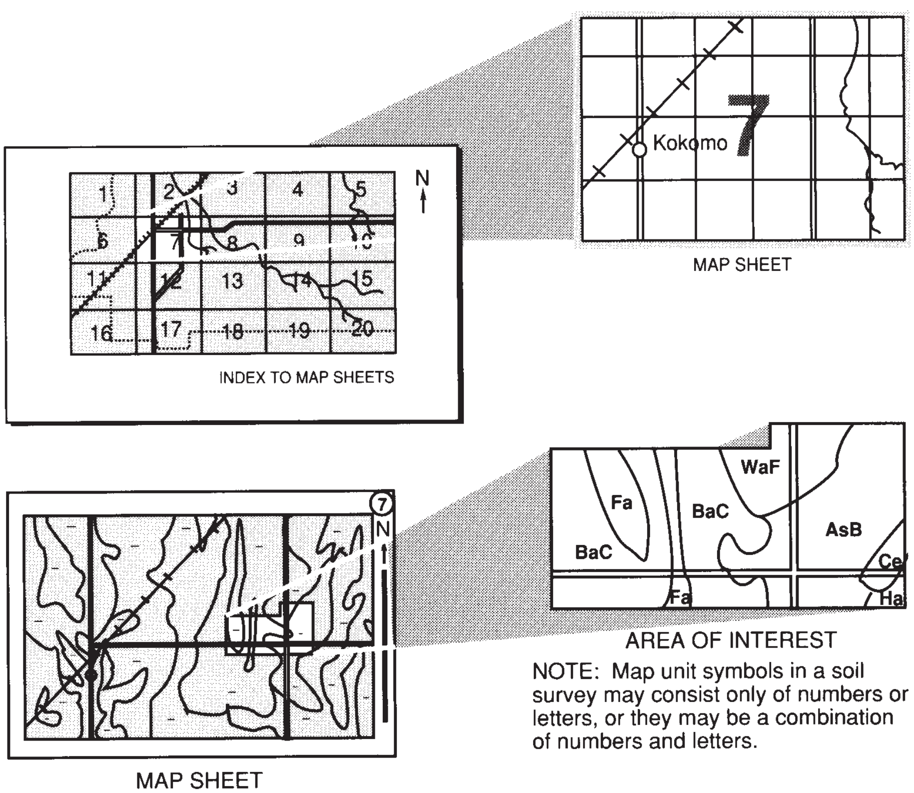
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service and the United States Department of the Interior, National Park Service; Washington State University, Agricultural Experiment Station; Island County; and Whidbey Island and Snohomish Conservation Districts.

Major fieldwork for this soil survey was completed in 2008. Soil names and descriptions were approved in 2008. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2008.

The most current official data are available at http://websoilsurvey.nrcs.usda.gov/app/.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Nondiscrimination Statement

Citation

United States Department of Agriculture, Natural Resources Conservation Service. 2008. Soil survey of Island County, Washington. http://soils.usda.gov/survey/printed_surveys/

Cover Caption

Looking south from Goose Rock toward Whidbey Island. Olympic Peninsula in background.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

Where to Get More Information

More information about soils is available from the website of the Soils Division of the Natural Resources Conservation Service (http://soils.usda.gov). This site includes links to other sites where additional information specific to the soils in the survey area can be accessed, including the Soil Data Mart (http://soildatamart.nrcs.usda.gov) and the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app).

Contents

Issued 2010

Foreword

This soil survey contains information that affects land use planning in the survey area. The information can be used to make predictions about soil behavior for selected land uses. Planners and engineers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in ecology, recreation, and wildlife management can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each map unit is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Roylene Rides at the Door
State Conservationist
Natural Resources Conservation Service

Location of Island County in Washington.

Soil Survey of
Island County, Washington

By Bruce Lindsay, Erik Dahlke, and Toby Rodgers, Natural Resources Conservation Service

Fieldwork by Bruce Lindsay, Erik Dahlke, Toby Rodgers, Mike Regan, Crystal Briggs, and Kathryn Smith, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
United States Department of the Interior, National Park Service;
Washington State University, Agricultural Experiment Station;
Island County; and Whidbey Island and Snohomish Conservation Districts

Island County is comprised of eight islands in the northwestern part of Washington, at the northern end of Puget Sound. The county is bounded on the north by Fidalgo Island in Skagit County, on the east by Skagit and Snohomish Counties, on the south by Snohomish and Kitsap Counties, and on the west by Jefferson County and the Strait of Juan de Fuca. The county is about 206 square miles in size, or 135,412 acres. Whidbey Island extends in a north-south direction. It is about 40 miles long and 1 to 10 miles wide. Camano Island, east of Whidbey Island, is the second largest island in Puget Sound. It is about 15 miles long and 1 to 7 miles wide. It is about one-fifth the size of Whidbey Island. Six other small islands are included in the county. They are Ben Ure, Strawberry, Smith, Baby, Deception, and Minor.

The climate of the county is temperate; summers are cool and dry, and winters are mild and moist. Most areas of the islands were once covered by dense forests, but there were some small areas of prairies that were covered mainly with grass. The prairies are the principal areas of the county that are cultivated.

This soil survey updates the survey of Island County, Washington, published in 1958 (USDA, 1958). It provides additional information and has larger maps, which show the soils in greater detail. The information on the Web Soil Survey is the most current official data. It can be accessed at http://websoilsurvey.nrcs.usda.gov.

General Nature of the County

This section gives general information about the county. It discusses history and development; population; physiography, relief, geology, and drainage; and climate.

History and Development

Island County was originally inhabited by Indian tribes whose economy was based on subsistence agriculture. In June of 1792, Joseph Whidbey, a member of the Vancouver Expedition from England, discovered the narrow passage that is now

known as Deception Pass. With the discovery of this pass, the existence of Whidbey Island was made known. French-Catholic missionaries, who arrived on May 28, 1840, were the first European settlers to come to Whidbey Island. Colonel Isaac N. Ebey was the first permanent white settler. In 1850, the first land claims were filed for the area known as Ebey’s Prairie on Whidbey Island.

Ebey’s Landing National Historical Reserve was established in 1978 “to preserve and protect a rural community which provides an unbroken historic record from 19th century exploration and settlement in Puget Sound to the present time” (USDI, 2005). The reserve was the first of its kind within the National park system. It is unique in that it covers four significant historic eras, including Vancouver’s exploration of Puget Sound in 1792, the first permanent settlement on Whidbey Island, the Donation Land Claim settlement and subsequent settlements, and the development of the town of Coupeville.

In 1988, an interlocal agreement established Ebey’s Landing National Historical Reserve as the first National Park Service area to be managed by a trust board. The board consists of nine volunteers representing the town of Coupeville, Island County, Washington State, and the National Park Service. The trust board employs one full-time employee that acts as the reserve manager.

Another unique characteristic of the reserve is that approximately 85 percent of the land is privately owned. Conservation easements within the reserve are voluntary by the private landowners, but they are an integral part of the preservation of the reserve. The goal of the easements is to preserve Ebey’s Prairie and maintain the rest of the reserve in its agrarian state. Many descendents of the original settlers still live in the area and are interested in preserving its historic and natural features.

Other land claims were filed for Oak Harbor during the same year as claims were filed for Ebey’s Prairie. Coveland was settled in 1853, and Utsalady, on Camano Island, in 1856. In 1857, Captain Coupe established the town of Coupeville, which became the county seat. Several small prairies at Crescent Harbor, Ebey’s Prairie, San de Fuca, Oak Harbor, Smith Prairie, and Keystone were settled first. The extensive forested upland areas gradually were claimed because of the timber. Lumbering was the principal industry in these areas. Island County was organized on January 6, 1853. In 1861, the part of the county on the mainland became part of Snohomish County.

In 1961, Camano Island became part of Snohomish Conservation District. The Whidbey Island Conservation District was established in 1967. These districts work to protect and restore the natural resources of the county. Conservation districts offer technical assistance to landowners as well as education and information about suitable management practices for agriculture, forestry, and homesite development. Services available include farm and forest conservation plans, site visits and consultations, engineering technical assistance, and in some cases, financing (cost-share facilitation) and permit assistance. The districts provide these services through funding from State agencies, such as the Puget Sound Partnership, the Conservation Commission, and the Department of Ecology, and Federal agencies, such as the Natural Resources Conservation Service. The conservation districts also provide technical assistance to various city and county entities and act as a liaison between landowners and regulatory agencies.

The conservation districts are not regulatory organizations; they are local organizations that work with the Natural Resources Conservation Service. In the 1930’s, commonly referred to as the Dust Bowl Era, the Soil Conservation Service (later renamed the Natural Resources Conservation Service) was established to help farmers minimize soil erosion and to protect the land for future generations. Local soil and water conservation districts were then formed, and Washington State conservation districts were established in the 1940’s.

Population

The population of Island County was 11,079 in 1950. All of the county was classified as rural. The population increased 81.7 percent from 1940 to 1950, mainly because of the United States Navy military reservations established at Oak Harbor and Crescent Harbor in 1942 (statistics from reports published by the United States Department of Commerce, Bureau of the Census). The present population is about 71,558 (USDC, 2000). Oak Harbor, the largest town in the county, has a population of about 19,975. The principal towns on Whidbey Island are Oak Harbor, Coupeville, Langley, and Clinton. All of these towns have post offices, and all of them except Clinton are incorporated. Other towns or communities on the island are San de Fuca, Greenbank, Freeland, Keystone, Bay View, Columbia Beach, Maxwelton, Glendale, and Saratoga. The principal towns on Camano Island are Camano, Utsalady, New Utsalady, Mabana, and Madrona Beach. These towns consist mainly of summer residences and resorts.

Physiography, Relief, Geology, and Drainage

By Jon Riedel, geologist, National Park Service, Ebey's Landing National Historical Reserve.

Island County is in the Puget Trough section of the Pacific Border province of the Pacific Mountain System physiographic division (Fenneman, 1931). Most of the soils are on undulating to rolling uplands that range in elevation from 100 to 300 feet. In a few areas, the uplands are as much as 500 feet in elevation. Several small areas of prairies are at an elevation of less than 100 feet, and other small areas of prairies are on the uplands. Some of the prairies are beds of former glacial lakes, and some are lagoons of former seas.

Areas of the county slope upward to fairly well-defined crests, or ridges, one of which extends the length of Whidbey Island and the other the length of Camano Island. The northeastern corner of Camano Island is gently undulating. The steepest slopes are at the southern end of Whidbey Island, where many areas have slopes of 15 to 25 percent.

No large streams are in Island County. Most of the streams in the county flow intermittently. During the rainy season, they serve as outlets for excess water. A few streams, most of which are in the southern part of Whidbey Island, are fed by springs and flow year round. Several small freshwater lakes are in the county. The main sources of water are wells, springs, and cisterns. Wells that are 200 feet deep or more generally supply sufficient amounts of water most of the year.

Island County is dominantly Quaternary deposits from the last Ice Age. These deposits form a variety of topographic features. The lack of bedrock exposure in the southern part of Whidbey Island is in contrast to many of the other islands in the San Juan Islands archipelago. The mix of glacial landforms on Whidbey Island is unique in the Puget Lowlands (Easterbrook, 1994).

The last Ice Age, 25,000 to 12,000 years ago, is known regionally as the Fraser Glaciation. Most of the landforms of Whidbey Island were formed near the end of this Ice Age, 16,000 to 12,400 years ago. At the peak of the Fraser Glaciation, approximately 18,000 years ago, the area was covered by the Puget Lobe of the Cordilleran Ice Sheet. The ice sheet progressed southward from Canada past Whidbey Island to Olympia, Washington, and westward through the Strait of Juan de Fuca. Evidence of this southward movement can be seen in the south-trending, streamlined hills and ridges north and south of the islands (Kovanen and Slaymaker, 2004).

Immediately north of Penn Cove, west-southwest-trending drumlins can be observed, suggesting a variation in the direction of the ice (Polenz and others, 2005). These features were eroded from older deposits, including the Possession Drift and the nonglacial Whidbey Formation, which are exposed along Blowers Bluff on

the north shore of Penn Cove and along Point Partridge and other shorelines. The Whidbey Formation represents fluvial deposits from the Olympia nonglacial interval, which ended about 30,000 years ago. Possession Drift is composed of sand and gravel diamict from an earlier glaciation.

A late glacial re-advance or still-stand of the Puget Lobe created the Coupeville moraine, which extends from east to west south of Penn Cove through the town of Coupeville (Polenz and others, 2005). To the west, the moraine merges with the hummocky kame and kettle topography at Fort Ebey State Park. The kettles were formed as huge blocks of ice were buried by and melted out of the Partridge Formation. Partridge gravel is poorly sorted, stained sand, silt, and gravel deposited by the northward retreat of the Cordilleran Ice Sheet in ice contact, alluvial fan and outwash settings.

At its maximum, the ice sheet was approximately 4,500 feet thick at Coupeville (Thorson, 1980). The weight of the sheet depressed the area several hundred feet below sea level (Dethier and others, 1995). The Cordilleran Ice Sheet was at the Coupeville moraine about 16,000 years ago, and meltwater streams west and east of the moraine built two deltas adjacent to the moraine. These deltas are made up of Partridge gravel as much as 300 feet thick. They were deposited as subglacial streams emerged from beneath the ice onto the sea floor. Many relict channels are on the surface of the deltas.

The leading edges of the deltas are steep slopes that define the western and eastern boundaries of Ebey's Prairie in Ebey's Landing National Historical Reserve. Ebey's Prairie is underlain by 20 to 50 feet of dense glaciomarine drift deposited from an ice shelf and icebergs as the glacier melted back to the Coupeville moraine. The elevation of the prairie is the same as many other marine platforms in the southern part of Whidbey Island. Glaciomarine drift is a highly variable material consisting of fossil-bearing, gravelly silt, sand, and clay and massive to laminated silt and clay.

As the immense weight of the ice was removed from the area during glacial retreat, the land emerged from below sea level. The time of emergence is believed to be about 16,000 years ago, based on marine shells discovered in the glacial deposits (Dethier and others, 1995; Polenz and others, 2005). As the sea level fell relative to the rising ground, waves cut benches and deposited beaches at many elevations as much as 250 feet above sea level along steep delta faces, drumlins, and streamlined hills (Dethier and others, 1995; Kovanen and Slaymaker, 2004). Landslides triggered by rapid emergence of the sea floor are along the shore of Penn Cove and elsewhere in the county (Polenz and others, 2005).

The landscape remains active today, even though the continental ice sheets have not been in the area for more than 12,000 years. Erosion and deposition are very active on the western shoreline of the county as a result of the strong winds, waves, and storms along the Strait of Juan de Fuca. Active landforms include beaches, berms, gravel spits, dunes, lagoons, and steep bluff faces.

Sand carried from the shoreline east onto the ancient deltas has formed a series of sand dunes south of Ebey's Landing State Park. Retreat of the bluff face has cut halfway into a kettle, exposing the kettle in cross-section. The floor of the kettle is covered with 50 feet of windblown sand deposited during the past 10,000 years.

The South Whidbey Island Fault is an active tectonic feature that runs northwest to southeast across the northern Puget Lowland (Gower, 1980). The fault is 2 to 4 miles wide, dips nearly vertically to the northeast, and is 26 miles long (Johnson and others, 1996). The fault crosses Whidbey Island on the parade grounds at Fort Casey, but no displacement of deposits from the last Ice Age has been documented onshore (Polenz and others, 2005).

Climate

By the National Water and Climate Center, Natural Resources Conservation Service, Portland, Oregon.

The climate tables for this survey were created from data collected at the Coupeville 1 S climate station in Washington. Table 1 gives data on temperature and precipitation for the county as recorded in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 40.7 degrees F and the average daily minimum temperature is 35.1 degrees. The lowest temperature on record, which occurred at Coupeville 1 S on December 3, 1968, is 3 degrees. In summer, the average temperature is 59.8 degrees and the average daily maximum temperature is 69.7 degrees. The highest temperature, which occurred at Coupeville 1 S on August 8, 1960, is 98 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is about 21.52 inches. Of this, about 6.26 inches, or 29 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.25 inches at Coupeville 1 S on September 1, 1983.

The average seasonal snowfall is 5.7 inches. The greatest snow depth at any one time during the period of record was 16 inches recorded on November 27, 1985. On an average, 2 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 16 inches recorded on December 29, 1996.

Table 1.--Temperature and Precipitation

(Recorded in the period 1971 to 2000 at Coupeville 1 S, Washington [178

Month	Temperature						Preci		
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in will have Less than--	Mo tha
	°F	°F	°F	°F	°F	Units	In	In	I
January	45.3	34.8	40.0	58	15	77	2.53	1.42	3.
February	48.5	35.6	42.0	61	18	94	1.83	1.14	2.
March	52.6	37.6	45.1	65	24	164	1.92	1.33	2.
April	57.1	40.2	48.6	73	29	259	1.67	1.15	2.
May	62.6	44.8	53.7	78	34	423	1.72	1.02	2.
June	66.5	48.3	57.4	82	39	522	1.36	0.68	2.
July	70.8	50.7	60.7	85	42	642	1.00	0.40	1.
August	71.9	51.0	61.4	86	42	665	0.92	0.28	1.
September	67.3	46.9	57.1	83	36	514	1.26	0.43	2.
October	58.2	42.1	50.2	72	28	314	1.71	0.79	2.
November	49.8	38.1	43.9	62	20	147	2.89	1.53	4.
December	45.0	35.0	40.0	57	15	76	2.73	1.50	3.
Yearly:									
Average	58.0	42.1	50.0	---	---	---	---	---	--
Extreme	90.0	5.0	---	88	10	---	---	---	--
Total	---	---	---	---	---	3,898	21.52	15.97	24.

Average number of days per year with at least 1 inch of snow on the ground: 2

*A growing degree day is a unit of heat available for plant growth. It can be calcul maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temper growth is minimal for the principal crops in the area (Threshold: 40 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1971 to 2000 at Coupeville 1 S, Washington [1783])

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than-----	March 6	April 7	May 1
2 years in 10 later than----	February 24	March 29	April 25
5 years in 10 later than----	February 5	March 11	April 14
First freezing temperature in fall:			
1 year in 10 earlier than---	November 3	October 26	October 7
2 years in 10 earlier than--	November 16	November 3	October 14
5 years in 10 earlier than--	December 12	November 19	October 27

Table 3.--Growing Season

(Recorded in the period 1971 to 2000 at Coupeville 1 S, Washington [1783])

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	*Days*	*Days*
9 years in 10---------------	277	221	171
8 years in 10---------------	292	236	183
5 years in 10---------------	320	264	206
2 years in 10---------------	348	293	229
1 year in 10----------------	363	308	240

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the county. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; and the kinds of crops and native plants. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA. This survey area is in MLRA 2—Willamette and Puget Sound Valleys.

The soils and miscellaneous areas in the county occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the county and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the county and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the county, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the county, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, parent material, vegetation, relief, and drainage (figs. 1 and 2, pp. 20 and 21). Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because it is generalized, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

1. Soils in valleys, drainageways, and depressions (Sholander-Coupeville-Coveland)

Percentage of survey area: 13 percent
Parent material: Glacial drift, dense glaciomarine deposits, and organic material
Depth class: Deep and very deep
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Spieden soils (fig. 6, p. 23), Endoaquents, and Semiahmoo and Puget soils

Characteristics of Sholander

Landform: Valleys
Slope: 0 to 8 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Very low to very high
Flooding frequency: None
Ponding frequency: Occasional (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 16 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.3 inches

Characteristics of Coupeville

Landform: Valleys (fig. 3, p. 22)
Slope: 0 to 3 percent

Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 9.6 inches

Characteristics of Coveland

Landform: Valleys
Slope: 0 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 9 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 7.3 inches

2. Lowland soils on gently sloping glaciomarine drift plains (Mitchellbay-Sucia-Sholander)

Percentage of survey area: 8 percent
Parent material: Glacial drift and dense glaciomarine deposits
Depth class: Moderately deep to very deep
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Coupeville, Spieden, and Morancreek soils

Characteristics of Mitchellbay, Cool

Landform: Valleys (fig. 4, p. 22)
Slope: 0 to 10 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: Occasional (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 15 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 6.2 inches

Characteristics of Sucia, Cool

Landform: Valleys
Slope: 0 to 15 percent

Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Moderately high to very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 8 to 31 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.5 inches

Characteristics of Sholander, Cool

Landform: Valleys
Slope: 2 to 12 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Very low to very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): At the soil surface to a depth of 28 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.3 inches

3. Altered soils (Urban land-Coupeville-Coveland)

Percentage of survey area: 1 percent
Parent material: Glacial drift, glacial outwash, dense glaciomarine deposits, and organic material
Depth class: Moderately deep to very deep
Elevation: 0 to 650 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Hoypus and Whidbey soils, Dumps, and Water, miscellaneous

Characteristics of Urban Land, Airport Runways

Slope: 0 to 2 percent

Characteristics of Coupeville

Landform: Valleys
Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 9.6 inches

Characteristics of Coveland

Landform: Valleys
Slope: 0 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 9 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 7.3 inches

4. Upland soils on gently sloping glacial drift plains (Zylstra-Elwha-Morancreek, cool)

Percentage of survey area: 20 percent
Parent material: Glacial drift, glacial outwash, and dense glaciomarine deposits
Depth class: Moderately deep and very deep
Elevation: 0 to 590 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Frostad, Alderwood, and Everett soils

Characteristics of Zylstra

Landform: Hillslopes
Slope: 0 to 12 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: Occasional (see Water Features table)
Seasonal high water table (minimum depth): About 12 to 18 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 4.6 inches

Characteristics of Elwha

Landform: Hillslopes (fig. 7, p. 23)
Slope: 2 to 12 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 22 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.9 inches

Characteristics of Morancreek, Cool

Landform: Hillslopes
Slope: 2 to 25 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): High
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 10 to 21 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 9.2 inches

5. Sandy soils on hills and ridges of striated outwash plains (Indianola-Uselessbay-Utsalady)

Percentage of survey area: 25 percent
Parent material: Glacial drift, glacial outwash, and dense glaciomarine deposits
Depth class: Moderately deep to very deep
Elevation: 0 to 520 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Sholander, Morancreek, Limepoint, and Spieden soils

Characteristics of Indianola

Landform: Hillslopes (fig. 8, p. 23)
Slope: 2 to 30 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High and very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 4.5 inches

Characteristics of Uselessbay

Landform: Ridges
Slope: 0 to 15 percent
Depth to restrictive feature: 28 to 39 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 28 to 39 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 2.7 inches

Characteristics of Utsalady

Landform: Ridges
Slope: 0 to 15 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 30 to 39 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.7 inches

6. Upland soils on hillslopes and ridges of glacial drift plains (Everett-Alderwood)

Percentage of survey area: 23 percent
Parent material: Glacial drift, glacial outwash, and dense glaciomarine deposits
Depth class: Moderately deep to very deep
Elevation: 0 to 590 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Aquic Dystroxerepts, Oxyaquic Xerorthents, and Morancreek soils

Characteristics of Everett

Landform: Hillslopes (fig. 5, p. 22)
Slope: 0 to 40 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High and very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.4 inches

Characteristics of Alderwood

Landform: Hillslopes
Slope: 3 to 40 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 10 to 18 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 5.5 inches

7. Upland soils on dry, south-facing hillslopes and ridges of glacial drift plains (Hoypus-Whidbey)

Percentage of survey area: 6 percent
Parent material: Glacial drift, glacial outwash, and dense glaciomarine deposits
Depth class: Moderately deep and very deep
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor component: Keystone soils

Characteristics of Hoypus

Landform: Hillslopes
Slope: 2 to 40 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High and very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.5 inches

Characteristics of Whidbey

Landform: Hillslopes
Slope: 2 to 15 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Very low to very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 34 to 39 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.3 inches

8. Prairie soils (Coveland, prairie-Coupeville, prairie-San Juan)

Percentage of survey area: 3 percent
Parent material: Glacial drift, glacial outwash, and dense glaciomarine deposits
Depth class: Moderately deep to very deep
Elevation: 0 to 220 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Snakelum, Ebeys, Townsend, and Bozarth soils

Characteristics of Coupeville, Prairie

Landform: Valleys
Slope: 0 to 3 percent

Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Very low to high
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 9.6 inches

Characteristics of Coveland, Prairie

Landform: Valleys
Slope: 0 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 9 inches (see Water Features table)
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 7.3 inches

Characteristics of San Juan

Landform: Hillslopes
Slope: 0 to 20 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High and very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3 inches

9. Soils and Rock outcrop on bedrock hills (Cady-Doebay, moist-Rock outcrop)

Percentage of survey area: 1 percent
Parent material: Glacial drift and colluvium
Depth class: Shallow and moderately deep
Elevation: 0 to 480 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days
Minor components: Haro and Hiddenridge soils

Characteristics of Cady

Landform: Hillslopes, mountain slopes
Slope: 5 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high and high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 3.7 inches

Characteristics of Doebay

Landform: Hillslopes, mountain slopes
Slope: 5 to 75 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high and high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Salinity (maximum): Nonsaline
Sodicity (maximum): Nonsodic
Available water capacity (entire profile): About 4.7 inches

Characteristics of Rock Outcrop

Slope: 5 to 75 percent
Kind of rock: Metasedimentary

THREE-DIMENSIONAL PERSPECTIVE OF GENERAL SOIL MAP UNITS

Figure 1. —View of Kristoferson Lake on Camano Island, looking southwest. The numbers in the polygons correspond to general soi image was created with a geographic information system by draping a digital orthographic photograph over a 10-meter digital el

THREE-DIMENSIONAL PERSPECTIVE OF GENERAL SOIL MAP UNITS

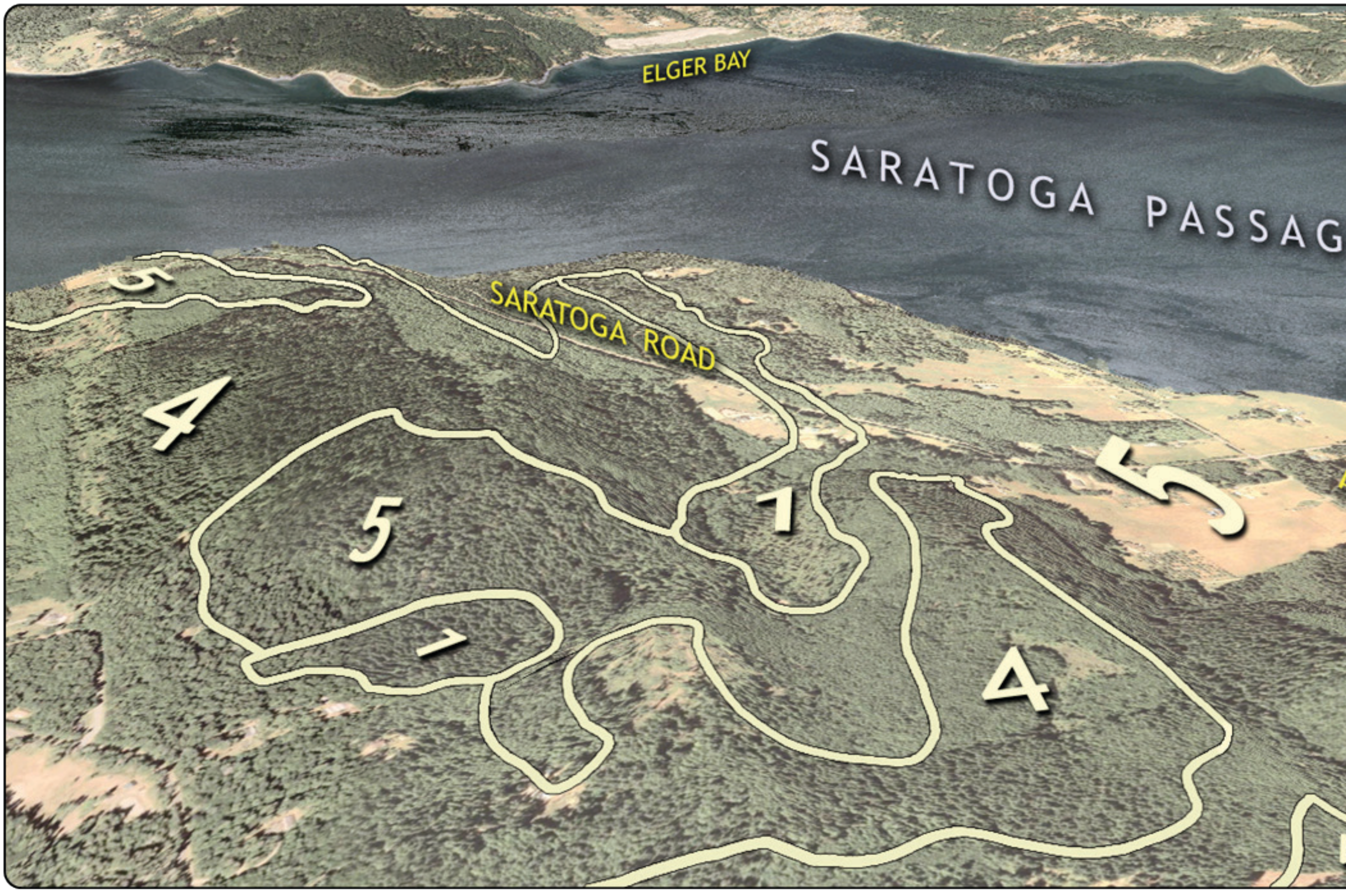


Figure 2. —View of East Point on Whidbey Island, looking northeast over Saratoga Passage. The numbers in the polygons correspor symbols. This image was created with a geographic information system by draping a digital orthographic photograph over a 10- model.

GENERAL SOIL MAP UNIT 1
"SOILS IN VALLEYS, DRAINAGEWAYS, AND DEPRESSIONS"

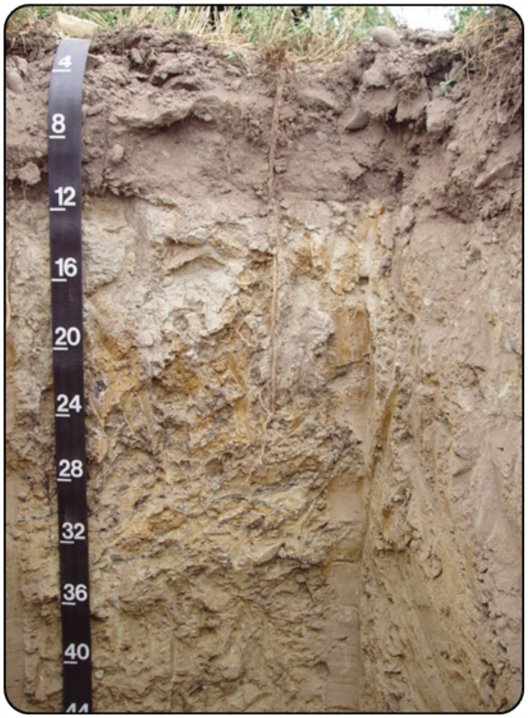


Figure 3. —Typical profile of the Coupeville soil series, a major component of general soil map unit 1. These soils formed in fine-loamy glacial drift over dense glaciomarine deposits. They are deep to a water- and root-restricting layer, are poorly drained, and support forests that are dominantly Sitka spruce and red alder. Numerals on tape indicate inches.

GENERAL SOIL MAP UNIT 2
"SOILS ON GENTLY SLOPING GLACIOMARINE DRIFT PLAINS"

Figure 4. —Typical profile of the Mitchellbay soil series, a major component of general soil map unit 2. These soils formed in fine-loamy glacial drift over dense glaciomarine deposits. They are moderately deep to a water- and root-restricting layer, are somewhat poorly drained, and support forests that are dominantly western hemlock and Douglas-fir. Numerals on tape indicate inches.

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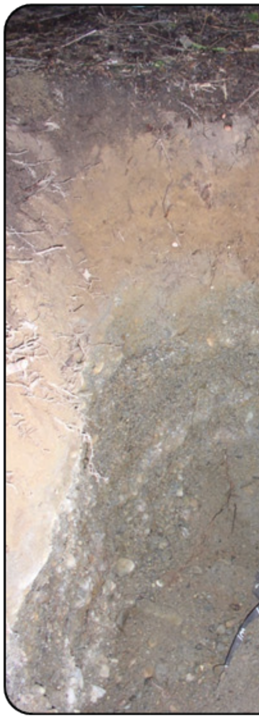

Figure 5. —Typical profile
series, a common so
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outwash. They are v
excessively drained
that are dominantly
Douglas-fir. Numera

GENERAL SOIL MAP UNIT 1
"SOILS IN VALLEYS, DRAINAGEWAYS, AND DEPRESSIONS"

Figure 6. —Typical profile of the Spieden soil series, a common soil in general soil map unit 1. These soils formed in sandy glacial outwash. They are very deep, are poorly drained, and support forests that are dominantly Sitka spruce and red alder.

GENERAL SOIL MAP UNIT 4
"UPLAND SOILS ON GLACIAL DRIFT PLAINS"

Figure 7. —Typical profile of the Elwha soil series, a major component of general soil map unit 4. These soils formed in coarse-loamy glacial drift. They are moderately deep to a water- and root-restricting layer, are moderately well drained, and support forests that are dominantly western hemlock and Douglas-fir. Numerals on tape indicate centimeters.

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Figure 8. —Typical prof
series, a major co
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Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name

of a soil phase commonly indicates a feature that affects use or management. For example, Limepoint soil, drained, is a phase of the Limepoint series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Sholander, cool-Spieden complex, 0 to 5 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Xerorthents-Endoaquents, tidal association, 0 to 100 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
994	Urban land--	82	*
995	Water, miscellaneous--	43	*
996	Dumps---	240	0.2
997	Pits, gravel--	458	0.3
998	Water, saline---	774	0.6
999	Water, fresh--	622	0.5
1005	Shalcar muck, 0 to 2 percent slopes---------------------------------------	387	0.3
1006	Semiahmoo muck, 0 to 2 percent slopes-------------------------------------	805	0.6
1016	Orcas peat, 0 to 2 percent slopes---	654	0.5
1017	Zylstra-Frostad complex, 0 to 3 percent slopes----------------------------	612	0.5
1018	Coupeville-Mitchellbay complex, 0 to 5 percent slopes---------------------	1,069	0.8
1019	Morancreek, cool-Limepoint complex, 0 to 5 percent slopes-----------------	246	0.2
1020	Sholander-Limepoint complex, 0 to 8 percent slopes------------------------	1,979	1.5
1021	Sholander, cool-Spieden complex, 0 to 5 percent slopes--------------------	2,926	2.2
1022	Coveland loam, cool, 0 to 5 percent slopes--------------------------------	2,201	1.6
1023	Coupeville loam, cool, 0 to 3 percent slopes------------------------------	1,447	1.1
1024	Limepoint-Sholander, cool, complex, 0 to 5 percent slopes-----------------	284	0.2
1025	Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes	3,135	2.3
1026	Coveland loam, prairie, 0 to 5 percent slopes-----------------------------	1,256	0.9
1027	Coupeville loam, prairie, 0 to 3 percent slopes---------------------------	698	0.5
1028	Orcas peat, drained, 0 to 2 percent slopes--------------------------------	471	0.3
1051	Coupeville-Ebeys complex, 0 to 5 percent slopes---------------------------	201	0.1
1052	Ebeys-Coupeville complex, 0 to 5 percent slopes---------------------------	332	0.2
1053	Dugualla muck, 0 to 2 percent slopes--------------------------------------	1,088	0.8
1054	Puget silty clay loam, 0 to 2 percent slopes------------------------------	771	0.6
1055	Urban land-Coupeville-Coveland complex, 0 to 5 percent slopes-------------	1,340	1.0
2000	Whidbey gravelly loam, 3 to 15 percent slopes-----------------------------	928	0.7
2010	Whidbey-Hoypus complex, 2 to 15 percent slopes----------------------------	1,703	1.3
2012	Elwha-Zylstra-Morancreek, cool, complex, 2 to 12 percent slopes-----------	18,505	13.7
2013	Zylstra-Frostad complex, 0 to 8 percent slopes----------------------------	3,115	2.3
2016	Zylstra-Alderwood complex, 3 to 30 percent slopes-------------------------	1,742	1.3
2017	Bozarth-Pilepoint complex, 2 to 8 percent slopes--------------------------	81	*
2018	Sucia loamy sand, cool, 2 to 10 percent slopes----------------------------	2,374	1.8
2019	Mitchellbay gravelly sandy loam, 2 to 10 percent slopes-------------------	6,545	4.8
2023	Sucia-Sholander complex, cool, 2 to 15 percent slopes---------------------	1,728	1.3
2024	Indianola-Uselessbay complex, 5 to 30 percent slopes----------------------	11,088	8.2
2025	Utsalady-Uselessbay complex, 2 to 12 percent slopes-----------------------	6,012	4.4
2026	Uselessbay-Utsalady complex, 0 to 10 percent slopes-----------------------	5,790	4.3
2027	Utsalady-Uselessbay complex, 0 to 5 percent slopes------------------------	1,647	1.2
2052	Townsend-San Juan complex, 3 to 15 percent slopes-------------------------	373	0.3
2054	Zylstra-Mitchellbay complex, 0 to 5 percent slopes------------------------	1,216	0.9
2055	Zylstra-Mitchellbay complex, 2 to 10 percent slopes-----------------------	780	0.6
3001	Hoypus sandy loam, 3 to 25 percent slopes---------------------------------	678	0.5
3003	Keystone-Utsalady complex, 0 to 3 percent slopes--------------------------	1,087	0.8
3005	San Juan sandy loam, 2 to 8 percent slopes--------------------------------	658	0.5
3007	San Juan sandy loam, 5 to 20 percent slopes-------------------------------	106	*
3008	Xerorthents-Endoaquents, tidal association, 0 to 100 percent slopes-------	576	0.4
3011	Everett-Alderwood complex, 0 to 5 percent slopes--------------------------	4,794	3.5
3017	Everett-Alderwood complex, 3 to 15 percent slopes-------------------------	13,133	9.7
3018	Everett sandy loam, 15 to 40 percent slopes-------------------------------	2,495	1.8
3019	Everett-Alderwood complex, 15 to 40 percent slopes------------------------	6,581	4.9
3020	Indianola loamy sand, 8 to 25 percent slopes------------------------------	1,523	1.1
3021	Indianola loamy sand, 0 to 5 percent slopes-------------------------------	2,202	1.6
3022	Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes	3,322	2.5
3024	Indianola loamy sand, 3 to 15 percent slopes------------------------------	5,968	4.4
3050	Hoypus sandy loam, 2 to 8 percent slopes----------------------------------	264	0.2
3051	Snakelum sandy loam, 0 to 2 percent slopes--------------------------------	641	0.5
3052	Everett-Hoypus association, 8 to 40 percent slopes------------------------	986	0.7
3053	Bozarth-Ebeys complex, 0 to 12 percent slopes-----------------------------	234	0.2
3054	Hoypus sandy loam, 0 to 3 percent slopes----------------------------------	2,111	1.6
5000	Cady-Rock outcrop complex, 5 to 30 percent slopes-------------------------	45	*
5001	Rock outcrop-Haro complex, 25 to 75 percent slopes------------------------	15	*
5003	Doebay-Morancreek complex, 5 to 25 percent slopes-------------------------	18	*
5006	Cady-Rock outcrop complex, 25 to 75 percent slopes------------------------	96	*

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
5007	Haro-Hiddenridge-Rock outcrop complex, 5 to 30 percent slopes	8	*
5015	Doebay, moist-Cady-Rock outcrop complex, 10 to 30 percent slopes	123	*
	Total	135,412	100.0

* Less than 0.1 percent.

994—Urban land

Map unit composition: Urban land—100 percent
Slope range: 0 to 2 percent

995—Water, miscellaneous

Map unit composition: Water, miscellaneous—100 percent

996—Dumps

Map Unit Setting

Elevation: 150 to 250 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Dumps: 100 percent

Interpretive Groups

Land capability subclass (nonirrigated): 8

997—Pits, gravel

Map Unit Setting

Elevation: 0 to 650 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Pits, gravel: 100 percent

Characteristics of Pits, Gravel

Slope range: 5 to 35 percent

Interpretive Groups

Land capability subclass (nonirrigated): 8

998—Water, saline

Map unit composition: Water, saline—100 percent

999—Water, fresh

Map unit composition: Water, fresh—100 percent

1005—Shalcar muck, 0 to 2 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 450 feet

Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Shalcar and similar soils: 80 percent
Dissimilar minor components: 20 percent

Characteristics of Shalcar

Setting
Landform: Depressions
Aspect (range): All aspects

Properties and qualities
Parent material: Muck over glacial outwash or dense glaciomarine deposits
Slope range: 0 to 2 percent
Depth to restrictive feature: 16 to 51 inches to strongly contrasting textural stratification
Drainage class: Very poorly drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Very high (about 15.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: BOG OR FEN (R002XN603WA)

Common trees
None

Typical profile
Oa1—0 to 3 inches; muck
Oa2—3 to 11 inches; muck
Oa3—11 to 22 inches; muck
2Bg1—22 to 27 inches; fine sandy loam
2Bg2—27 to 44 inches; silt loam
2Cg—44 to 60 inches; sandy loam

Dissimilar Minor Components

Shalcar soils, drained
Percentage of map unit: 10 percent
Landform: Depressions

Semiahmoo soils
Percentage of map unit: 10 percent
Landform: Depressions

1006—Semiahmoo muck, 0 to 2 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 450 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Semiahmoo and similar soils: 80 percent
Dissimilar minor components: 20 percent

Characteristics of Semiahmoo

Setting
Landform: Depressions
Aspect (range): All aspects

Properties and qualities
Parent material: Muck with a thin layer of volcanic ash mixed with diatomaceous earth
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Very poorly drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Very high (about 37.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: BOG OR FEN (R002XN603WA)

Common trees
None

Typical profile
Oa1—0 to 9 inches; muck
C—9 to 10 inches; silt loam
Oa2—10 to 30 inches; muck
Oa3—30 to 48 inches; muck
Oa4—48 to 60 inches; muck
Oe1—60 to 72 inches; mucky peat
Oe2—72 to 84 inches; mucky peat

Dissimilar Minor Components

Semiahmoo soils, drained
Percentage of map unit: 10 percent
Landform: Depressions

Shalcar soils
Percentage of map unit: 10 percent
Landform: Depressions

1016—Orcas peat, 0 to 2 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 340 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Orcas and similar soils: 100 percent

Characteristics of Orcas

Setting
Landform: Depressions
Aspect (range): All aspects

Properties and qualities
Parent material: Peat
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Very poorly drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)
Available water capacity (entire profile): Very high (about 26.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: BOG OR FEN (R002XN603WA)

Common trees
None

Typical profile
Oi1—0 to 3 inches; peat
Oi2—3 to 12 inches; peat
Oi3—12 to 60 inches; peat

1017—Zylstra-Frostad complex, 0 to 3 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 510 feet
Mean annual precipitation: 20 to 40 inches

Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Zylstra and similar soils: 60 percent
Frostad and similar soils: 30 percent
Dissimilar minor component: 10 percent

Characteristics of Zylstra

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glacial drift
Slope range: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 12 inches; loam
E—12 to 18 inches; sandy loam
Bg1—18 to 32 inches; gravelly sandy loam
Bg2—32 to 37 inches; gravelly loam
Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Frostad

Setting
Landform: Drainageways, valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glacial drift
Slope range: 0 to 3 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None

Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Very low (about 2.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loam
Bg—6 to 16 inches; sandy loam
E—16 to 21 inches; gravelly sandy loam
2Cd—21 to 60 inches; sandy loam

Dissimilar Minor Component

Frostad soils, drained
Percentage of map unit: 10 percent
Landform: Drainageways, valleys

1018—Coupeville-Mitchellbay complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains (fig. 9)
Elevation: 0 to 310 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Coupeville and similar soils: 50 percent
Mitchellbay, cool, and similar soils: 40 percent
Dissimilar minor component: 10 percent

Characteristics of Coupeville

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)

Figure 9.—Area of Coupeville-Michellbay complex, 0 to 5 percent slopes. This map unit is on drift plains, and the vegetation consists of red alder, Douglas-fir, Sitka spruce, and western swordfern. The Coupeville soils are poorly drained, and the Mitchellbay soils are somewhat poorly drained.

Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Ap—0 to 7 inches; loam
A—7 to 12 inches; loam
2E—12 to 20 inches; clay loam
2Btg1—20 to 34 inches; clay loam
2Btg2—34 to 50 inches; clay loam
2Cd—50 to 60 inches; silty clay loam

Characteristics of Mitchellbay, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 5 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.2 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; gravelly sandy loam
Bw—6 to 15 inches; sandy loam
E—15 to 20 inches; sandy loam
2Btg1—20 to 26 inches; loam
2Btg2—26 to 38 inches; loam
2Cd—38 to 60 inches; loam

Dissimilar Minor Component

Coupeville soils, drained
Percentage of map unit: 10 percent
Landform: Valleys

1019—Morancreek, cool-Limepoint complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Hills
Elevation: 240 to 540 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Morancreek, cool, and similar soils: 55 percent
Limepoint and similar soils: 35 percent
Dissimilar minor component: 10 percent

Characteristics of Morancreek, Cool

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift
Slope range: 2 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): High
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 28 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.2 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 4e
Forage suitability group: Sloping to Steep Soils (G002XN702WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 3 inches; sandy loam
Bw1—3 to 10 inches; sandy loam
Bw2—10 to 21 inches; sandy loam
Bg—21 to 28 inches; sandy loam
C—28 to 60 inches; sandy loam

Characteristics of Limepoint

Setting
Landform: Valleys, drainageways
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 7.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 6e
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 6 inches; mucky silt loam
A2—6 to 14 inches; loam
Bg—14 to 31 inches; loamy coarse sand
Cg1—31 to 49 inches; loam
Cg2—49 to 58 inches; sandy loam
2Cd—58 to 60 inches; silty clay loam

Dissimilar Minor Component

Shalcar soils
Percentage of map unit: 10 percent
Landform: Depressions

1020—Sholander-Limepoint complex, 0 to 8 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Sholander, cool, and similar soils: 75 percent
Limepoint and similar soils: 20 percent
Dissimilar minor component: 5 percent

Characteristics of Sholander, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash over dense glaciomarine deposits
Slope range: 2 to 8 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A—0 to 8 inches; gravelly loam
E—8 to 16 inches; gravelly sandy loam
Bg1—16 to 28 inches; gravelly loamy sand
Bg2—28 to 51 inches; gravelly sand
2Cd—51 to 60 inches; loam

Characteristics of Limepoint

Setting
Landform: Drainageways, valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 7.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 6 inches; mucky silt loam
A2—6 to 14 inches; loam
Bg—14 to 31 inches; loamy coarse sand
Cg1—31 to 49 inches; loam
Cg2—49 to 58 inches; sandy loam
2Cd—58 to 60 inches; silty clay loam

Dissimilar Minor Component

Shalcar soils
Percentage of map unit: 5 percent
Landform: Depressions

1021—Sholander, cool-Spieden complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 410 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Sholander, cool, and similar soils: 45 percent
Spieden and similar soils: 35 percent
Dissimilar minor components: 20 percent

Characteristics of Sholander, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash over dense glaciomarine deposits
Slope range: 2 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A—0 to 8 inches; gravelly loam
E—8 to 16 inches; gravelly sandy loam
Bg1—16 to 28 inches; gravelly loamy sand
Bg2—28 to 51 inches; gravelly sand
2Cd—51 to 60 inches; loam

Characteristics of Spieden

Setting
Landform: Drainageways
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Low (about 4.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; mucky silt loam
A2—4 to 11 inches; silt loam
E—11 to 24 inches; gravelly loamy sand
Bg—24 to 36 inches; gravelly loamy coarse sand
C1—36 to 48 inches; coarse sand
C2—48 to 60 inches; coarse sand

Dissimilar Minor Components

Spieden soils, drained
Percentage of map unit: 10 percent
Landform: Drainageways

Sucia soils, cool
Percentage of map unit: 10 percent
Landform: Valleys

1022—Coveland loam, cool, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Coveland, cool, and similar soils: 70 percent
Dissimilar minor components: 30 percent

Characteristics of Coveland, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 7.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6w
Land capability subclass (irrigated): 6w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 9 inches; loam
E—9 to 20 inches; sandy loam
2Btg1—20 to 36 inches; silty clay loam
2Btg2—36 to 44 inches; silt loam
2Cd—44 to 60 inches; silt loam

Dissimilar Minor Components

Coveland soils, cool, drained
Percentage of map unit: 10 percent
Landform: Valleys

Coupeville soils
Percentage of map unit: 10 percent
Landform: Valleys

Sucia soils, cool
Percentage of map unit: 10 percent
Landform: Valleys

1023—Coupeville loam, cool, 0 to 3 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 290 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Coupeville and similar soils: 80 percent
Dissimilar minor components: 20 percent

Characteristics of Coupeville

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)

Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Ap—0 to 7 inches; loam
A—7 to 12 inches; loam
2E—12 to 20 inches; clay loam
2Btg1—20 to 34 inches; clay loam
2Btg2—34 to 50 inches; clay loam
2Cd—50 to 60 inches; silty clay loam

Dissimilar Minor Components

Coupeville soils, drained
Percentage of map unit: 10 percent
Landform: Valleys

Coveland soils, cool
Percentage of map unit: 10 percent
Landform: Valleys

1024—Limepoint-Sholander, cool, complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 300 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Limepoint and similar soils: 60 percent
Sholander, cool, and similar soils: 20 percent
Dissimilar minor components: 20 percent

Characteristics of Limepoint

Setting
Landform: Valleys, drainageways
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to dense material

Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 7.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 6 inches; mucky silt loam
A2—6 to 14 inches; loam
Bg—14 to 31 inches; loamy coarse sand
Cg1—31 to 49 inches; loam
Cg2—49 to 58 inches; sandy loam
2Cd—58 to 60 inches; silty clay loam

Characteristics of Sholander, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash over dense glaciomarine deposits
Slope range: 2 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A—0 to 8 inches; gravelly loam
E—8 to 16 inches; gravelly sandy loam
Bg1—16 to 28 inches; gravelly loamy sand

Bg2—28 to 51 inches; gravelly sand
2Cd—51 to 60 inches; loam

Dissimilar Minor Components

Limepoint soils, drained
Percentage of map unit: 10 percent
Landform: Valleys, drainageways

Shalcar soils
Percentage of map unit: 10 percent
Landform: Depressions

1025—Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes

Map Unit Setting

General landscape: Shore complexes (fig. 10)
Elevation: 0 to 20 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Beaches: 50 percent
Endoaquents, tidal, and similar soils: 30 percent
Xerorthents and similar soils: 20 percent

Figure 10.—Area of Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes. This map unit is on shore complexes. It consists of beaches and areas that support salt marsh vegetation.

Characteristics of Beaches

Setting
Landform: Beaches
Aspect (range): All aspects

Properties and qualities
Parent material: Beach sand
Slope range: 0 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Capacity to transmit water (Ksat): Unspecified
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)

Interpretive groups
Land capability subclass (nonirrigated): 8

Common trees
None

Typical profile
C—0 to 60 inches; stratified sand to gravel

Characteristics of Endoaquents, Tidal

Setting
Landform: Beaches
Aspect (range): All aspects

Properties and qualities
Parent material: Beach sand
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Very poorly drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)
Salinity (maximum): Nonsaline (about 1.5 millimhos per centimeter)
Sodicity (maximum): Sodium adsorption ratio about 1
Available water capacity (entire profile): Very low (about 1.8 inches)

Interpretive groups
Land capability subclass (nonirrigated): 8
Ecological site: LOW SALT MARSH (R002XN713WA)

Common trees
None

Typical profile
C1—0 to 29 inches; gravelly sand
C2—29 to 48 inches; very gravelly coarse sand
C3—48 to 60 inches; extremely gravelly coarse sand

Characteristics of Xerorthents

Setting
Landform: Hillslopes, beaches
Aspect (range): All aspects

Properties and qualities
Parent material: Beach sand and colluvium derived from glacial outwash
Slope range: 0 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Excessively drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Very low (about 0.6 inch)

Interpretive groups
Land capability subclass (nonirrigated): 7s
Ecological site: SALT WATER BLUFF (R002XN702WA)

Common trees
None

Typical profile
A—0 to 1 inch; very gravelly sand
C1—1 to 20 inches; very gravelly sand
C2—20 to 60 inches; very gravelly sand

1026—Coveland loam, prairie, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 200 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Coveland, prairie, and similar soils: 70 percent
Dissimilar minor components: 30 percent

Characteristics of Coveland, Prairie

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 7.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6w
Land capability subclass (irrigated): 6w

Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: WET PRAIRIE (R002XN613WA)

Common trees
None

Typical profile
A1—0 to 4 inches; loam
A2—4 to 9 inches; loam
E—9 to 20 inches; sandy loam
2Btg1—20 to 36 inches; silty clay loam
2Btg2—36 to 44 inches; silt loam
2Cd—44 to 60 inches; silt loam

Dissimilar Minor Components

Coveland soils, prairie, drained
Percentage of map unit: 10 percent
Landform: Valleys

Coupeville soils, prairie
Percentage of map unit: 10 percent
Landform: Valleys

Sucia soils, prairie
Percentage of map unit: 10 percent
Landform: Valleys

1027—Coupeville loam, prairie, 0 to 3 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 200 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Coupeville, prairie, and similar soils: 80 percent
Dissimilar minor components: 20 percent

Characteristics of Coupeville, Prairie

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: WET PRAIRIE (R002XN613WA)

Common trees
None

Typical profile
Ap—0 to 7 inches; loam
A—7 to 12 inches; loam
2E—12 to 20 inches; clay loam
2Btg1—20 to 34 inches; clay loam
2Btg2—34 to 50 inches; clay loam
2Cd—50 to 60 inches; silty clay loam

Dissimilar Minor Components

Coupeville soils, prairie, drained
Percentage of map unit: 10 percent
Landform: Valleys

Coveland soils, prairie
Percentage of map unit: 10 percent
Landform: Valleys

1028—Orcas peat, drained, 0 to 2 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 340 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Orcas, drained, and similar soils: 100 percent

Characteristics of Orcas, Drained

Setting
Landform: Depressions
Aspect (range): All aspects

Properties and qualities
Parent material: Slightly decomposed plant material
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Very poorly drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Very high (about 26.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: BOG OR FEN (R002XN603WA)

Common trees
None

Typical profile
Oi1—0 to 3 inches; peat
Oi2—3 to 12 inches; peat
Oi3—12 to 60 inches; peat

1051—Coupeville-Ebeys complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 170 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Coupeville, prairie, and similar soils: 70 percent
Ebeys and similar soils: 20 percent
Dissimilar minor component: 10 percent

Characteristics of Coupeville, Prairie

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: WET PRAIRIE (R002XN613WA)

Common trees
None

Typical profile
Ap—0 to 7 inches; loam
A—7 to 12 inches; loam
2E—12 to 20 inches; clay loam
2Btg1—20 to 34 inches; clay loam
2Btg2—34 to 50 inches; clay loam
2Cd—50 to 60 inches; silty clay loam

Characteristics of Ebeys

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Eolian sand over sandy glaciomarine deposits
Slope range: 2 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 32 inches (see Water Features table)
Available water capacity (entire profile): Low (about 6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
Ap—0 to 6 inches; loam
A—6 to 15 inches; loam
Bw—15 to 23 inches; sandy loam
Bg—23 to 34 inches; loamy sand
Cg1—34 to 50 inches; loamy sand
Cg2—50 to 60 inches; fine sand

Dissimilar Minor Component

Coupeville soils, prairie, drained
Percentage of map unit: 10 percent
Landform: Valleys

1052—Ebeys-Coupeville complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains (fig. 11)
Elevation: 0 to 160 feet

Figure 11.—Area of Ebeys-Coupeville complex, 0 to 5 percent slopes. This map unit is on flat drift plains consisting of eolian sand over sandy glaciomarine deposits (Ebeys soil) and glacial drift over dense glaciomarine deposits (Coupeville soil). It has been maintained as grassland and farms for a long time, and it supports prairie vegetation.

Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Ebeys and similar soils: 70 percent
Coupeville, prairie, and similar soils: 20 percent
Dissimilar minor component: 10 percent

Characteristics of Ebeys

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Eolian sand over sandy glaciomarine deposits
Slope range: 2 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 32 inches (see Water Features table)

Available water capacity (entire profile): Low (about 6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
Ap—0 to 6 inches; loam
A—6 to 15 inches; loam
Bw—15 to 23 inches; sandy loam
Bg—23 to 34 inches; loamy sand
Cg1—34 to 50 inches; loamy sand
Cg2—50 to 60 inches; fine sand

Characteristics of Coupeville, Prairie

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: WET PRAIRIE (R002XN613WA)

Common trees
None

Typical profile
Ap—0 to 7 inches; loam
A—7 to 12 inches; loam
2E—12 to 20 inches; clay loam
2Btg1—20 to 34 inches; clay loam
2Btg2—34 to 50 inches; clay loam
2Cd—50 to 60 inches; silty clay loam

Dissimilar Minor Component

Coupeville soils, prairie, drained
Percentage of map unit: 10 percent
Landform: Valleys

1053—Dugualla muck, 0 to 2 percent slopes

Map Unit Setting

General landscape: Shore complexes
Elevation: 0 to 10 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Dugualla and similar soils: 80 percent
Dissimilar minor components: 20 percent

Characteristics of Dugualla

Setting
Landform: Depressions, tidal flats
Aspect (range): All aspects

Properties and qualities
Parent material: Herbaceous organic deposits
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Very poorly drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)
Salinity (maximum): Strongly saline (about 50 millimhos per centimeter)
Sodicity (maximum): Sodium adsorption ratio about 3
Available water capacity (entire profile): Very high (about 26.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Land capability subclass (irrigated): 6s
Ecological site: HIGH SALT MARSH (R002XN703WA)

Common trees
None

Typical profile
Oa1—0 to 11 inches; muck
Oa2—11 to 20 inches; muck
Oa3—20 to 26 inches; muck
Oa4—26 to 60 inches; muck

Dissimilar Minor Components

Dugualla soils, protected
Percentage of map unit: 10 percent
Landform: Depressions, tidal flats

Endoaquents, tidal
Percentage of map unit: 10 percent
Landform: Depressions, tidal flats

1054—Puget silty clay loam, 0 to 2 percent slopes

Map Unit Setting

General landscape: Shore complexes
Elevation: 0 to 10 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Puget, drained, and similar soils: 90 percent
Dissimilar minor components: 10 percent

Characteristics of Puget, Drained

Setting
Landform: Tidal flats
Aspect (range): All aspects

Properties and qualities
Parent material: Alluvium
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Moderately low to moderately high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): High (about 12 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 3w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A—0 to 7 inches; silty clay loam
Bg1—7 to 17 inches; silty clay loam
Bg2—17 to 25 inches; silty clay loam
Bg3—25 to 31 inches; silty clay loam
Bg4—31 to 40 inches; silty clay loam
Cg1—40 to 45 inches; silty clay loam
Cg2—45 to 60 inches; silty clay loam

Dissimilar Minor Components

Endoaquents, tidal
Percentage of map unit: 5 percent
Landform: Beaches

Xerorthents
Percentage of map unit: 5 percent
Landform: Hillslopes, sea cliffs, beaches

1055—Urban land-Coupeville-Coveland, 0 to 5 percent slopes

Map Unit Setting

Elevation: 0 to 300 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Urban land: 60 percent
Coupeville and similar soils: 15 percent
Coveland and similar soils: 15 percent
Dissimilar minor components: 10 percent

Characteristics of Urban Land

Slope range: 0 to 2 percent

Characteristics of Coupeville

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 2 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w
Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Ap—0 to 7 inches; loam
A—7 to 12 inches; loam
2E—12 to 20 inches; clay loam
2Btg1—20 to 34 inches; clay loam

2Btg2—34 to 50 inches; clay loam
2Cd—50 to 60 inches; silty clay loam

Characteristics of Coveland

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 5 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 7.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6w
Land capability subclass (irrigated): 6w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 9 inches; loam
E—9 to 20 inches; sandy loam
2Btg1—20 to 36 inches; silty clay loam
2Btg2—36 to 44 inches; silt loam
2Cd—44 to 60 inches; silt loam

Dissimilar Minor Components

Hoypus soils
Percentage of map unit: 5 percent
Landform: Hillslopes

Whidbey soils
Percentage of map unit: 5 percent
Landform: Hillslopes

2000—Whidbey gravelly loam, 3 to 15 percent slopes

Map Unit Setting

General landscape: Hills, drift plains
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 35 inches

Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Whidbey and similar soils: 90 percent
Dissimilar minor component: 10 percent

Characteristics of Whidbey

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift over dense glacial drift
Slope range: 3 to 15 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 6 inches; gravelly loam
Bw—6 to 20 inches; very gravelly sandy loam
Bg—20 to 37 inches; very gravelly sandy loam
2Cd—37 to 60 inches; gravelly sandy loam

Dissimilar Minor Component

Hoypus soils
Percentage of map unit: 10 percent
Landform: Hillslopes

2010—Whidbey-Hoypus complex, 2 to 15 percent slopes

Map Unit Setting

General landscape: Drift plains, hills
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Whidbey and similar soils: 60 percent
Hoypus and similar soils: 40 percent

Characteristics of Whidbey

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift over dense glacial drift
Slope range: 2 to 10 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 6 inches; gravelly loam
Bw—6 to 20 inches; very gravelly sandy loam
Bg—20 to 37 inches; very gravelly sandy loam
2Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Hoypus

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial outwash
Slope range: 5 to 15 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 5 inches; sandy loam
Bw1—5 to 20 inches; loamy sand
Bw2—20 to 36 inches; very gravelly loamy sand
C—36 to 60 inches; extremely gravelly sand

2012—Elwha-Zylstra-Morancreek, cool, complex, 2 to 12 percent slopes

Map Unit Setting

General landscape: Drift plains (fig. 12)
Elevation: 0 to 550 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Elwha and similar soils: 40 percent
Zylstra and similar soils: 30 percent
Morancreek, cool, and similar soils: 20 percent
Dissimilar minor component: 10 percent

Characteristics of Elwha

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 12 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 3e
Forage suitability group: Droughty Soils (G002XN402WA)

Figure 12.—Area of Elwha-Zylstra-Morancreek, cool, complex, 2 to 12 percent slopes. This map unit is on hillslopes and ridges of drift plains. It consists of moderately textured soils with an impermeable, compact densic layer.

Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees

Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile

Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 6 inches; gravelly sandy loam
Bw1—6 to 14 inches; gravelly sandy loam
Bw2—14 to 26 inches; gravelly sandy loam
Bg—26 to 35 inches; gravelly sandy loam
2Cd1—35 to 44 inches; sandy loam
2Cd2—44 to 60 inches; sandy loam

Characteristics of Zylstra

Setting

Landform: Ridges
Aspect (range): All aspects

Properties and qualities

Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 12 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained

Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 12 inches; loam
E—12 to 18 inches; sandy loam
Bg1—18 to 32 inches; gravelly sandy loam
Bg2—32 to 37 inches; gravelly loam
Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Morancreek, Cool

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift
Slope range: 2 to 12 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): High
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 28 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.2 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 4e
Forage suitability group: Sloping to Steep Soils (G002XN702WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 3 inches; sandy loam

Bw1—3 to 10 inches; sandy loam
Bw2—10 to 21 inches; sandy loam
Bg—21 to 28 inches; sandy loam
C—28 to 60 inches; sandy loam

Dissimilar Minor Component

Everett soils
Percentage of map unit: 10 percent
Landform: Hillslopes

2013—Zylstra-Frostad complex, 0 to 8 percent slopes

Map Unit Setting

General landscape: Drift plains (fig. 13)
Elevation: 20 to 590 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Zylstra and similar soils: 75 percent
Frostad and similar soils: 15 percent
Dissimilar minor component: 10 percent

Figure 13.—Area of Zylstra-Frostad complex, 0 to 8 percent slopes. This map unit is on broad, flat summits and in slightly concave areas of drift plains. The Zylstra soil is somewhat poorly drained, and the Frostad soil is poorly drained.

Characteristics of Zylstra

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glacial drift
Slope range: 2 to 8 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 12 inches; loam
E—12 to 18 inches; sandy loam
Bg1—18 to 32 inches; gravelly sandy loam
Bg2—32 to 37 inches; gravelly loam
Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Frostad

Setting
Landform: Drainageways, valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: Frequent (see Water Features table)
Seasonal high water table (minimum depth): At the soil surface to a depth of 8 inches (see Water Features table)
Available water capacity (entire profile): Very low (about 2.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 5w
Land capability subclass (irrigated): 5w

Forage suitability group: Wet Soils (G002XN102WA)
Ecological site: Sitka spruce–red alder/salmonberry/field horsetail (F002XN904WA)

Common trees
Sitka spruce, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loam
Bg—6 to 16 inches; sandy loam
E—16 to 21 inches; gravelly sandy loam
2Cd—21 to 60 inches; sandy loam

Dissimilar Minor Component

Elwha soils
Percentage of map unit: 10 percent
Landform: Hillslopes

2016—Zylstra-Alderwood complex, 3 to 30 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 30 to 510 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Zylstra and similar soils: 50 percent
Alderwood and similar soils: 30 percent
Dissimilar minor components: 20 percent

Characteristics of Zylstra

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glacial drift
Slope range: 3 to 12 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 12 inches; loam
E—12 to 18 inches; sandy loam
Bg1—18 to 32 inches; gravelly sandy loam
Bg2—32 to 37 inches; gravelly loam
Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Alderwood

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 12 to 30 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 5.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Land capability subclass (irrigated): 6s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 10 inches; extremely gravelly sandy loam
Bw—10 to 18 inches; extremely gravelly coarse sandy loam
Bg—18 to 36 inches; extremely gravelly coarse sandy loam
2Cd—36 to 60 inches; gravelly silty clay loam

Dissimilar Minor Components

Everett soils
Percentage of map unit: 10 percent
Landform: Hillslopes

Frostad soils
Percentage of map unit: 10 percent
Landform: Drainageways, valleys

2017—Bozarth-Pilepoint complex, 2 to 8 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 20 to 140 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Bozarth and similar soils: 50 percent
Pilepoint and similar soils: 50 percent

Characteristics of Bozarth

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Eolian sand over glaciomarine deposits
Slope range: 2 to 8 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 3s
Forage suitability group: Moderately Productive Agricultural Soils (G002XN602WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 10 inches; sandy loam
A2—10 to 16 inches; fine sandy loam
A3—16 to 19 inches; fine sandy loam
E—19 to 23 inches; fine sandy loam
2Bg—23 to 35 inches; sandy loam
2Cd—35 to 60 inches; silt loam

Characteristics of Pilepoint

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Eolian sand over glacial outwash and dense glaciomarine deposits

Slope range: 2 to 8 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 3w
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 4 inches; loam
A2—4 to 13 inches; loam
Bw—13 to 22 inches; very gravelly sandy loam
E—22 to 29 inches; gravelly loamy sand
2Btg—29 to 36 inches; silt loam
2Cd1—36 to 46 inches; silt loam
2Cd2—46 to 60 inches; silt loam

2018—Sucia loamy sand, cool, 2 to 10 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 330 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Sucia, cool, and similar soils: 90 percent
Dissimilar minor component: 10 percent

Characteristics of Sucia, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 10 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None

Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A—0 to 8 inches; loamy sand
Bw—8 to 17 inches; loamy sand
E—17 to 31 inches; gravelly loamy sand
2Btg—31 to 38 inches; loam
2Cd—38 to 60 inches; silt loam

Dissimilar Minor Component

Sholander soils, cool
Percentage of map unit: 10 percent
Landform: Valleys

2019—Mitchellbay gravelly sandy loam, 2 to 10 percent slopes

Map Unit Setting

General landscape: Drift plains (fig. 14)
Elevation: 0 to 280 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Mitchellbay, cool, and similar soils: 90 percent
Dissimilar minor component: 10 percent

Characteristics of Mitchellbay, Cool

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 10 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None

Figure 14.—Area of Mitchellbay gravelly sandy loam, 2 to 10 percent slopes, on hillslopes in background. The hillslopes provide topographic relief for improved runoff, which prevents ponding.

Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.2 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; gravelly sandy loam
Bw—6 to 15 inches; sandy loam
E—15 to 20 inches; sandy loam
2Btg1—20 to 26 inches; loam
2Btg2—26 to 38 inches; loam
2Cd—38 to 60 inches; loam

Dissimilar Minor Component

Coupeville soils
Percentage of map unit: 10 percent
Landform: Valleys

2023—Sucia-Sholander complex, cool, 2 to 15 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Sucia, cool, and similar soils: 50 percent
Sholander, cool, and similar soils: 40 percent
Dissimilar minor component: 10 percent

Characteristics of Sucia, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 15 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3e
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A—0 to 8 inches; loamy sand
Bw—8 to 17 inches; loamy sand
E—17 to 31 inches; gravelly loamy sand
2Btg—31 to 38 inches; loam
2Cd—38 to 60 inches; silt loam

Characteristics of Sholander, Cool

Setting
Landform: Valleys
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash over dense glaciomarine deposits
Slope range: 2 to 12 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4e
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A—0 to 8 inches; gravelly loam
E—8 to 16 inches; gravelly sandy loam
Bg1—16 to 28 inches; gravelly loamy sand
Bg2—28 to 51 inches; gravelly sand
2Cd—51 to 60 inches; loam

Dissimilar Minor Component

Spieden soils
Percentage of map unit: 10 percent
Landform: Drainageways

2024—Indianola-Uselessbay complex, 5 to 30 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 520 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Indianola and similar soils: 55 percent
Uselessbay and similar soils: 35 percent
Dissimilar minor component: 10 percent

Characteristics of Indianola

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 5 to 30 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loamy sand
Bw1—6 to 17 inches; loamy sand
Bw2—17 to 27 inches; sand
BC—27 to 37 inches; sand
C—37 to 60 inches; sand

Characteristics of Uselessbay

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Very low (about 2.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 3 inches; gravelly sandy loam
Bw1—3 to 8 inches; gravelly sandy loam
Bw2—8 to 15 inches; gravelly loamy sand
C—15 to 29 inches; gravelly sand
Cg—29 to 37 inches; gravelly sand
Cd—37 to 60 inches; gravelly sandy loam

Dissimilar Minor Component

Utsalady soils
Percentage of map unit: 10 percent
Landform: Ridges

2025—Utsalady-Uselessbay complex, 2 to 12 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 20 to 510 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Utsalady and similar soils: 55 percent
Uselessbay and similar soils: 35 percent
Dissimilar minor component: 10 percent

Characteristics of Utsalady

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 2 to 12 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Well drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 36 to 48 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3e
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
E—1 to 2 inches; loamy sand
Bw1—2 to 15 inches; loamy sand
Bw2—15 to 31 inches; loamy sand
Bw3—31 to 42 inches; loamy sand
C—42 to 50 inches; sand
Cg1—50 to 55 inches; loamy sand
Cg2—55 to 60 inches; sand

Characteristics of Uselessbay

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 2 to 12 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Very low (about 2.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 3 inches; gravelly sandy loam
Bw1—3 to 8 inches; gravelly sandy loam
Bw2—8 to 15 inches; gravelly loamy sand
C—15 to 29 inches; gravelly sand
Cg—29 to 37 inches; gravelly sand
Cd—37 to 60 inches; gravelly sandy loam

Dissimilar Minor Component

Spieden soils
Percentage of map unit: 10 percent
Landform: Drainageways

2026—Uselessbay-Utsalady complex, 0 to 10 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 470 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Uselessbay and similar soils: 60 percent
Utsalady and similar soils: 30 percent
Dissimilar minor component: 10 percent

Characteristics of Uselessbay

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 10 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Very low (about 2.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 3 inches; gravelly sandy loam
Bw1—3 to 8 inches; gravelly sandy loam
Bw2—8 to 15 inches; gravelly loamy sand
C—15 to 29 inches; gravelly sand
Cg—29 to 37 inches; gravelly sand
Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Utsalady

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 10 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Well drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 36 to 48 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3e
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
E—1 to 2 inches; loamy sand
Bw1—2 to 15 inches; loamy sand
Bw2—15 to 31 inches; loamy sand
Bw3—31 to 42 inches; loamy sand
C—42 to 50 inches; sand
Cg1—50 to 55 inches; loamy sand
Cg2—55 to 60 inches; sand

Dissimilar Minor Component

Spieden soils
Percentage of map unit: 10 percent
Landform: Drainageways

2027—Utsalady-Uselessbay complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 20 to 510 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Utsalady and similar soils: 70 percent
Uselessbay and similar soils: 20 percent
Dissimilar minor component: 10 percent

Characteristics of Utsalady

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Well drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 36 to 48 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3e
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
E—1 to 2 inches; loamy sand
Bw1—2 to 15 inches; loamy sand
Bw2—15 to 31 inches; loamy sand
Bw3—31 to 42 inches; loamy sand
C—42 to 50 inches; sand
Cg1—50 to 55 inches; loamy sand
Cg2—55 to 60 inches; sand

Characteristics of Uselessbay

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 5 percent
Depth to restrictive feature: 2 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Very low (about 2.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 3 inches; gravelly sandy loam
Bw1—3 to 8 inches; gravelly sandy loam
Bw2—8 to 15 inches; gravelly loamy sand
C—15 to 29 inches; gravelly sand
Cg—29 to 37 inches; gravelly sand
Cd—37 to 60 inches; gravelly sandy loam

Dissimilar Minor Component

Spieden soils
Percentage of map unit: 10 percent
Landform: Drainageways

2052—Townsend-San Juan complex, 3 to 15 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 200 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Townsend and similar soils: 70 percent
San Juan and similar soils: 30 percent

Characteristics of Townsend

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift over dense glacial drift
Slope range: 3 to 15 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None

Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Very low (about 2.9 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 5e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 5 inches; gravelly loam
A2—5 to 18 inches; very gravelly loam
AB—18 to 24 inches; very gravelly sandy loam
2Bg—24 to 36 inches; very gravelly sandy loam
2Cd—36 to 60 inches; very gravelly sandy loam

Characteristics of San Juan

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Eolian sand over glacial outwash
Slope range: 3 to 15 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 6e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 4 inches; sandy loam
A2—4 to 13 inches; sandy loam
A3—13 to 19 inches; sandy loam
Bw—19 to 27 inches; gravelly loamy coarse sand
C1—27 to 41 inches; extremely gravelly coarse sand
C2—41 to 62 inches; extremely gravelly coarse sand
C3—62 to 70 inches; extremely gravelly coarse sand

2054—Zylstra-Mitchellbay complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 30 to 250 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Zylstra and similar soils: 80 percent
Mitchellbay, cool, and similar soils: 20 percent

Characteristics of Zylstra

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 5 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 4.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 12 inches; loam
E—12 to 18 inches; sandy loam
Bg1—18 to 32 inches; gravelly sandy loam
Bg2—32 to 37 inches; gravelly loam
Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Mitchellbay, Cool

Setting
Landform: Valleys, hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 5 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.2 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; gravelly sandy loam
Bw—6 to 15 inches; sandy loam
E—15 to 20 inches; sandy loam
2Btg1—20 to 26 inches; loam
2Btg2—26 to 38 inches; loam
2Cd—38 to 60 inches; loam

2055—Zylstra-Mitchellbay complex, 2 to 10 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 260 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Zylstra and similar soils: 80 percent
Mitchellbay, cool, and similar soils: 20 percent

Characteristics of Zylstra

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 10 percent

Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 4.6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
A1—0 to 4 inches; loam
A2—4 to 12 inches; loam
E—12 to 18 inches; sandy loam
Bg1—18 to 32 inches; gravelly sandy loam
Bg2—32 to 37 inches; gravelly loam
Cd—37 to 60 inches; gravelly sandy loam

Characteristics of Mitchellbay, Cool

Setting
Landform: Valleys, hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 10 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.2 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4w
Land capability subclass (irrigated): 4w
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; gravelly sandy loam
Bw—6 to 15 inches; sandy loam
E—15 to 20 inches; sandy loam
2Btg1—20 to 26 inches; loam
2Btg2—26 to 38 inches; loam
2Cd—38 to 60 inches; loam

3001—Hoypus sandy loam, 3 to 25 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 250 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Hoypus and similar soils: 100 percent

Characteristics of Hoypus

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial outwash
Slope range: 3 to 25 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 6e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 5 inches; sandy loam
Bw1—5 to 20 inches; loamy sand
Bw2—20 to 36 inches; very gravelly loamy sand
C—36 to 60 inches; extremely gravelly sand

3003—Keystone-Utsalady complex, 0 to 3 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 520 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Keystone and similar soils: 60 percent
Utsalady and similar soils: 30 percent
Dissimilar minor component: 10 percent

Characteristics of Keystone

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 3 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A1—1 to 3 inches; sandy loam
A2—3 to 8 inches; sandy loam
Bw1—8 to 19 inches; loamy sand
Bw2—19 to 34 inches; very gravelly loamy sand
C—34 to 60 inches; loamy sand

Characteristics of Utsalady

Setting
Landform: Ridges
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 3 percent

Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Well drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 36 to 48 inches (see Water Features table)
Available water capacity (entire profile): Low (about 3.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3e
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
E—1 to 2 inches; loamy sand
Bw1—2 to 15 inches; loamy sand
Bw2—15 to 31 inches; loamy sand
Bw3—31 to 42 inches; loamy sand
C—42 to 50 inches; sand
Cg1—50 to 55 inches; loamy sand
Cg2—55 to 60 inches; sand

Dissimilar Minor Component

Sucia soils, cool
Percentage of map unit: 10 percent
Landform: Valleys

3005—San Juan sandy loam, 2 to 8 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 120 to 220 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

San Juan and similar soils: 100 percent

Characteristics of San Juan

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Eolian sand over glacial outwash
Slope range: 2 to 8 percent

Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 4 inches; sandy loam
A2—4 to 13 inches; sandy loam
A3—13 to 19 inches; sandy loam
Bw—19 to 27 inches; gravelly loamy coarse sand
C1—27 to 41 inches; extremely gravelly coarse sand
C2—41 to 62 inches; extremely gravelly coarse sand
C3—62 to 70 inches; extremely gravelly coarse sand

3007—San Juan sandy loam, 5 to 20 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 110 to 200 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

San Juan and similar soils: 100 percent

Characteristics of San Juan

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Eolian sand over glacial outwash
Slope range: 5 to 20 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 6e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 4 inches; sandy loam
A2—4 to 13 inches; sandy loam
A3—13 to 19 inches; sandy loam
Bw—19 to 27 inches; gravelly loamy coarse sand
C1—27 to 41 inches; extremely gravelly coarse sand
C2—41 to 62 inches; extremely gravelly coarse sand
C3—62 to 70 inches; extremely gravelly coarse sand

3008—Xerorthents-Endoaquents, tidal association, 0 to 100 percent slopes

Map Unit Setting

General landscape: Shore complexes (fig. 15)
Elevation: 0 to 250 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Xerorthents and similar soils: 70 percent
Endoaquents, tidal, and similar soils: 20 percent
Dissimilar minor component: 10 percent

Characteristics of Xerorthents

Setting
Landform: Hillslopes, sea cliffs, beaches
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Beach sand and colluvium derived from glacial outwash
Slope range: 5 to 100 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Excessively drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Very low (about 0.6 inch)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Ecological site: SALT WATER BLUFF (R002XN702WA)

Common trees
None

Figure 15.—Area of Xerorthents-Endoaquents, tidal association, 0 to 100 percent slopes. This map unit comprises the very steep escarpment of the bluff at the edge of Whidbey and Camano Islands.

Typical profile
A—0 to 1 inch; very gravelly sand
C1—1 to 20 inches; very gravelly sand
C2—20 to 60 inches; very gravelly sand

Characteristics of Endoaquents, Tidal

Setting
Landform: Beaches
Aspect (range): All aspects

Properties and qualities
Parent material: Beach sand
Slope range: 0 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Very poorly drained
Capacity to transmit water (Ksat): Very high
Flooding frequency: Very frequent (see Water Features table)
Ponding frequency: None
Seasonal high water table (minimum depth): At the soil surface (see Water Features table)
Salinity (maximum): Nonsaline (about 1.5 millimhos per centimeter)
Sodicity (maximum): Sodium adsorption ratio about 1
Available water capacity (entire profile): Very low (about 1.8 inches)

Interpretive groups
Land capability subclass (nonirrigated): 7w
Ecological site: LOW SALT MARSH (R002XN713WA)

Common trees
None

Typical profile
C1—0 to 29 inches; gravelly sand
C2—29 to 48 inches; very gravelly coarse sand
C3—48 to 60 inches; extremely gravelly coarse sand

Dissimilar Minor Component

Beaches
Percentage of map unit: 10 percent
Landform: Beaches

3011—Everett-Alderwood complex, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 590 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Everett and similar soils: 70 percent
Alderwood and similar soils: 30 percent

Characteristics of Everett

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.4 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 9 inches; sandy loam

Bw1—9 to 13 inches; gravelly sandy loam
Bw2—13 to 30 inches; very gravelly coarse sand
C—30 to 60 inches; extremely gravelly coarse sand

Characteristics of Alderwood

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 5 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 5.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Land capability subclass (irrigated): 6s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 10 inches; extremely gravelly sandy loam
Bw—10 to 18 inches; extremely gravelly coarse sandy loam
Bg—18 to 36 inches; extremely gravelly coarse sandy loam
2Cd—36 to 60 inches; gravelly silty clay loam

3017—Everett-Alderwood complex, 3 to 15 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 590 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Everett and similar soils: 70 percent
Alderwood and similar soils: 30 percent

Characteristics of Everett

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 3 to 15 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.4 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 9 inches; sandy loam
Bw1—9 to 13 inches; gravelly sandy loam
Bw2—13 to 30 inches; very gravelly coarse sand
C—30 to 60 inches; extremely gravelly coarse sand

Characteristics of Alderwood

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 3 to 15 percent
Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 5.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Land capability subclass (irrigated): 6s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 10 inches; extremely gravelly sandy loam
Bw—10 to 18 inches; extremely gravelly coarse sandy loam
Bg—18 to 36 inches; extremely gravelly coarse sandy loam
2Cd—36 to 60 inches; gravelly silty clay loam

3018—Everett sandy loam, 15 to 40 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 540 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Everett and similar soils: 100 percent

Characteristics of Everett

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 15 to 40 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.4 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 9 inches; sandy loam
Bw1—9 to 13 inches; gravelly sandy loam
Bw2—13 to 30 inches; very gravelly coarse sand
C—30 to 60 inches; extremely gravelly coarse sand

3019—Everett-Alderwood complex, 15 to 40 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 590 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Everett and similar soils: 45 percent
Alderwood and similar soils: 45 percent
Dissimilar minor component: 10 percent

Characteristics of Everett

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 15 to 40 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.4 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 9 inches; sandy loam
Bw1—9 to 13 inches; gravelly sandy loam
Bw2—13 to 30 inches; very gravelly coarse sand
C—30 to 60 inches; extremely gravelly coarse sand

Characteristics of Alderwood

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 15 to 40 percent

Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 12 to 20 inches (see Water Features table)
Available water capacity (entire profile): Low (about 5.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Land capability subclass (irrigated): 6s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 10 inches; extremely gravelly sandy loam
Bw—10 to 18 inches; extremely gravelly coarse sandy loam
Bg—18 to 36 inches; extremely gravelly coarse sandy loam
2Cd—36 to 60 inches; gravelly silty clay loam

Dissimilar Minor Component

Morancreek soils, cool
Percentage of map unit: 10 percent
Landform: Hillslopes

3020—Indianola loamy sand, 8 to 25 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 520 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Indianola and similar soils: 100 percent

Characteristics of Indianola

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 8 to 25 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None

Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loamy sand
Bw1—6 to 17 inches; loamy sand
Bw2—17 to 27 inches; sand
BC—27 to 37 inches; sand
C—37 to 60 inches; sand

3021—Indianola loamy sand, 0 to 5 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 520 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Indianola and similar soils: 100 percent

Characteristics of Indianola

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 5 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loamy sand
Bw1—6 to 17 inches; loamy sand
Bw2—17 to 27 inches; sand
BC—27 to 37 inches; sand
C—37 to 60 inches; sand

3022—Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes

Map Unit Setting

General landscape: Shore complexes
Elevation: 0 to 250 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Aquic Dystroxerepts, coastal bluffs, and similar soils: 45 percent
Oxyaquic Xerorthents and similar soils: 45 percent
Dissimilar minor component: 10 percent

Characteristics of Aquic Dystroxerepts, Coastal Bluffs

Setting
Landform: Sea cliffs
Aspect (representative): North
Aspect (range): Southwest to southeast (clockwise)

Properties and qualities
Parent material: Beach sand and colluvium derived from glacial drift
Slope range: 15 to 70 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 28 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.8 inches)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Land capability subclass (irrigated): 7e
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
None

Typical profile
Oi—0 to 4 inches; slightly decomposed plant material
Oe—4 to 7 inches; moderately decomposed plant material
Bw—7 to 17 inches; loamy sand
Bg1—17 to 41 inches; silt loam
Bg2—41 to 55 inches; fine sandy loam
Cg—55 to 63 inches; fine sandy loam

Characteristics of Oxyaquic Xerorthents

Setting
Landform: Hillslopes, sea cliffs
Aspect (representative): North
Aspect (range): Southwest to southeast (clockwise)

Properties and qualities
Parent material: Beach sand and colluvium derived from glacial drift
Slope range: 15 to 70 percent
Depth to restrictive feature: 40 to 60 inches to dense material
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Low to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 28 inches (see Water Features table)
Available water capacity (entire profile): Moderate (about 6.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Land capability subclass (irrigated): 7e
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
None

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
Oe—2 to 5 inches; moderately decomposed plant material
A—5 to 9 inches; sand
Bw—9 to 11 inches; sand
C1—11 to 19 inches; sand
C2—19 to 36 inches; sand
2Cg—36 to 58 inches; very fine sandy loam
2Cd—58 to 83 inches; very fine sandy loam

Dissimilar Minor Component

Beaches
Percentage of map unit: 10 percent
Landform: Beaches

3024—Indianola loamy sand, 3 to 15 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches

Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Indianola and similar soils: 100 percent

Characteristics of Indianola

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 3 to 15 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loamy sand
Bw1—6 to 17 inches; loamy sand
Bw2—17 to 27 inches; sand
BC—27 to 37 inches; sand
C—37 to 60 inches; sand

3050—Hoypus sandy loam, 2 to 8 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 250 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Hoypus and similar soils: 100 percent

Characteristics of Hoypus

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 2 to 8 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 5 inches; sandy loam
Bw1—5 to 20 inches; loamy sand
Bw2—20 to 36 inches; very gravelly loamy sand
C—36 to 60 inches; extremely gravelly sand

3051—Snakelum-San Juan complex, 0 to 2 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 150 to 220 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Snakelum and similar soils: 80 percent
San Juan and similar soils: 20 percent

Characteristics of Snakelum

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Compact glacial outwash
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)

Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A—0 to 10 inches; coarse sandy loam
AB—10 to 18 inches; sandy loam
Bw—18 to 24 inches; sandy loam
2BC—24 to 48 inches; loamy coarse sand
2C—48 to 60 inches; coarse sand

Characteristics of San Juan

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Eolian sand over glacial outwash
Slope range: 0 to 2 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 4 inches; sandy loam
A2—4 to 13 inches; sandy loam
A3—13 to 19 inches; sandy loam
Bw—19 to 27 inches; gravelly loamy coarse sand
C1—27 to 41 inches; extremely gravelly coarse sand
C2—41 to 62 inches; extremely gravelly coarse sand
C3—62 to 70 inches; extremely gravelly coarse sand

3052—Everett-Hoypus association, 8 to 40 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 250 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Everett and similar soils: 55 percent
Hoypus and similar soils: 35 percent
Dissimilar minor component: 10 percent

Characteristics of Everett

Setting
Landform: Hillslopes
Aspect (representative): North
Aspect (range): West to east (clockwise)

Properties and qualities
Parent material: Glacial outwash
Slope range: 8 to 40 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.4 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4e
Land capability subclass (irrigated): 6e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Western hemlock–western redcedar/red huckleberry–salal/western swordfern (F002XN906WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 2 inches; slightly decomposed plant material
A—2 to 9 inches; sandy loam
Bw1—9 to 13 inches; gravelly sandy loam
Bw2—13 to 30 inches; very gravelly coarse sand
C—30 to 60 inches; extremely gravelly coarse sand

Characteristics of Hoypus

Setting
Landform: Hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial outwash
Slope range: 8 to 40 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6e
Land capability subclass (irrigated): 7e
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 5 inches; sandy loam
Bw1—5 to 20 inches; loamy sand
Bw2—20 to 36 inches; very gravelly loamy sand
C—36 to 60 inches; extremely gravelly sand

Dissimilar Minor Component

Utsalady soils
Percentage of map unit: 10 percent
Landform: Ridges

3053—Bozarth-Ebeys complex, 0 to 12 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 50 to 250 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Bozarth and similar soils: 80 percent
Ebeys and similar soils: 20 percent

Characteristics of Bozarth

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Eolian sand over dense glaciomarine deposits
Slope range: 0 to 8 percent

Depth to restrictive feature: 20 to 40 inches to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (Ksat): Low to high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 4 to 12 inches (see Water Features table)
Available water capacity (entire profile): Low (about 4.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 3s
Forage suitability group: Moderately Productive Agricultural Soils (G002XN602WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
A1—0 to 10 inches; sandy loam
A2—10 to 16 inches; fine sandy loam
A3—16 to 19 inches; fine sandy loam
E—19 to 23 inches; fine sandy loam
2Bg—23 to 35 inches; sandy loam
2Cd—35 to 60 inches; silt loam

Characteristics of Ebeys

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Eolian sand over sandy glaciomarine deposits
Slope range: 0 to 12 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 32 inches (see Water Features table)
Available water capacity (entire profile): Low (about 6 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: XERIC PRAIRIE (R002XN502WA)

Common trees
None

Typical profile
Ap—0 to 6 inches; loam
A—6 to 15 inches; loam
Bw—15 to 23 inches; sandy loam
Bg—23 to 34 inches; loamy sand

Cg1—34 to 50 inches; loamy sand
Cg2—50 to 60 inches; fine sand

3054—Hoypus sandy loam, 0 to 3 percent slopes

Map Unit Setting

General landscape: Drift plains
Elevation: 0 to 250 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Hoypus and similar soils: 100 percent

Characteristics of Hoypus

Setting
Landform: Hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial outwash
Slope range: 0 to 3 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Somewhat excessively drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.5 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3s
Land capability subclass (irrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 5 inches; sandy loam
Bw1—5 to 20 inches; loamy sand
Bw2—20 to 36 inches; very gravelly loamy sand
C—36 to 60 inches; extremely gravelly sand

5000—Cady-Rock outcrop complex, 5 to 30 percent slopes

Map Unit Setting

General landscape: Hills, mountains
Elevation: 0 to 2,400 feet
Mean annual precipitation: 20 to 40 inches

Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Cady and similar soils: 45 percent
Rock outcrop: 35 percent
Dissimilar minor components: 20 percent

Characteristics of Cady

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 5 to 30 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 4 inches; loam
Bw—4 to 16 inches; fine sandy loam
R—16 to 26 inches; unweathered bedrock

Characteristics of Rock Outcrop

Slope range: 5 to 30 percent
Land capability subclass (nonirrigated): 8
Common trees: None
Typical profile: R—0 to 60 inches; unweathered bedrock

Dissimilar Minor Components

Doebay soils
Percentage of map unit: 10 percent
Landform: Mountain slopes, hillslopes

Killebrew soils
Percentage of map unit: 10 percent
Landform: Hillslopes, mountain slopes

5001—Rock outcrop-Haro complex, 25 to 75 percent slopes

Map Unit Setting

Elevation: 0 to 1,300 feet (fig. 16)
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Rock outcrop: 50 percent
Haro and similar soils: 40 percent
Dissimilar minor component: 10 percent

Characteristics of Rock Outcrop

Slope range: 25 to 75 percent
Land capability subclass (nonirrigated): 8
Common trees: None
Typical profile: R—0 to 60 inches; unweathered bedrock

Characteristics of Haro

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

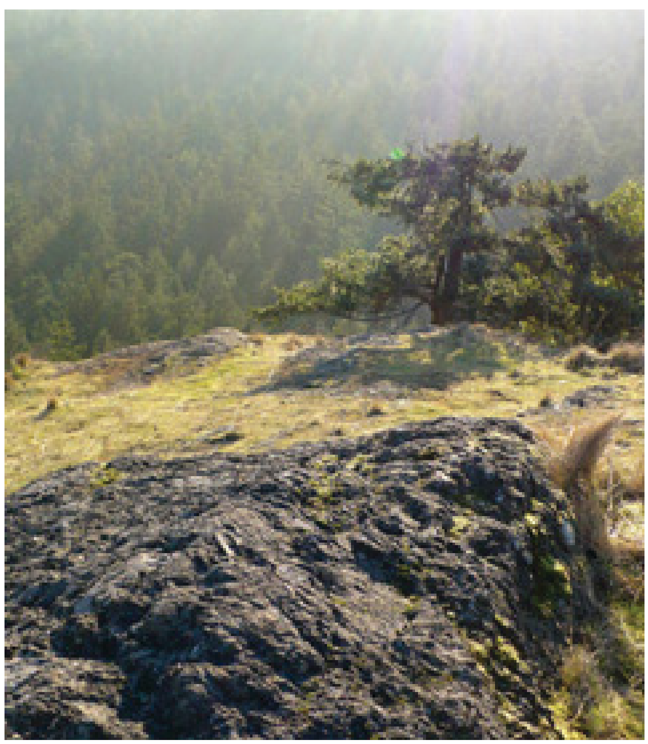

Figure 16.—Area of Rock outcrop-Haro complex, 25 to 75 percent slopes. This map unit is in the vicinity of Deception Pass. The Haro soil is shallow and supports grassland vegetation.

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 25 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Very low (about 1.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Ecological site: PRAIRIE BALD (R002XN202WA)

Common trees
None

Typical profile
A1—0 to 1 inch; loam
A2—1 to 5 inches; gravelly loam
Bw—5 to 11 inches; gravelly sandy loam
R—11 to 21 inches; unweathered bedrock

Dissimilar Minor Component

Hiddenridge soils
Percentage of map unit: 10 percent
Landform: Hillslopes, mountain slopes

5003—Doebay-Morancreek complex, 5 to 25 percent slopes

Map Unit Setting

General landscape: Hills, mountains
Elevation: 0 to 900 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Doebay and similar soils: 50 percent
Morancreek and similar soils: 30 percent
Dissimilar minor components: 20 percent

Characteristics of Doebay

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock

Slope range: 5 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4e
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loam
Bw1—6 to 16 inches; fine sandy loam
Bw2—16 to 21 inches; very gravelly sandy loam
C—21 to 35 inches; extremely gravelly sandy loam
R—35 to 45 inches; unweathered bedrock

Characteristics of Morancreek

Setting
Landform: Mountain slopes, hillslopes
Aspect (range): All aspects

Properties and qualities
Parent material: Glacial drift
Slope range: 5 to 25 percent
Depth to restrictive feature: None within a depth of 60 inches
Drainage class: Moderately well drained
Capacity to transmit water (Ksat): High
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): About 16 to 28 inches (see Water Features table)
Available water capacity (entire profile): High (about 9.2 inches)

Interpretive groups
Land capability subclass (nonirrigated): 3w
Land capability subclass (irrigated): 4e
Forage suitability group: Sloping to Steep Soils (G002XN702WA)
Ecological site: Western redcedar–Douglas-fir/salal/swordfern (F002XN903WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 3 inches; sandy loam

Bw1—3 to 10 inches; sandy loam
Bw2—10 to 21 inches; sandy loam
Bg—21 to 28 inches; sandy loam
C—28 to 60 inches; sandy loam

Dissimilar Minor Components

Cady soils
Percentage of map unit: 10 percent
Landform: Hillslopes, mountain slopes

Rock outcrop
Percentage of map unit: 10 percent

5006—Cady-Doebay-Rock outcrop complex, 25 to 75 percent slopes

Map Unit Setting

General landscape: Hills, mountains
Elevation: 0 to 2,350 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Cady and similar soils: 70 percent
Doebay and similar soils: 15 percent
Rock outcrop: 15 percent

Characteristics of Cady

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 25 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material

A—1 to 4 inches; loam
Bw—4 to 16 inches; fine sandy loam
R—16 to 26 inches; unweathered bedrock

Characteristics of Doebay

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 25 to 75 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 7e
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loam
Bw1—6 to 16 inches; fine sandy loam
Bw2—16 to 21 inches; very gravelly sandy loam
C—21 to 35 inches; extremely gravelly sandy loam
R—35 to 45 inches; unweathered bedrock

Characteristics of Rock Outcrop

Slope range: 25 to 75 percent
Land capability subclass (nonirrigated): 8
Common trees: None
Typical profile: R—0 to 60 inches; unweathered bedrock

5007—Haro-Hiddenridge-Rock outcrop complex, 5 to 30 percent slopes

Map Unit Setting

General landscape: Hills, mountains
Elevation: 0 to 1,500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Haro and similar soils: 50 percent
Hiddenridge and similar soils: 30 percent
Rock outcrop: 20 percent

Characteristics of Haro

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 5 to 30 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high to very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Very low (about 1.3 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6s
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: PRAIRIE BALD (R002XN202WA)

Common trees
None

Typical profile
A1—0 to 1 inch; loam
A2—1 to 5 inches; gravelly loam
Bw—5 to 11 inches; gravelly sandy loam
R—11 to 21 inches; unweathered bedrock

Characteristics of Hiddenridge

Setting
Landform: Mountain slopes, hillslopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): High or very high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.1 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4s
Forage suitability group: Droughty Soils (G002XN402WA)
Ecological site: PRAIRIE BALD (R002XN202WA)

Common trees
None

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A1—1 to 3 inches; gravelly coarse sandy loam
A2—3 to 24 inches; very gravelly coarse sandy loam
C—24 to 57 inches; extremely gravelly coarse sandy loam
R—57 to 60 inches; unweathered bedrock

Characteristics of Rock Outcrop

Slope range: 5 to 30 percent
Land capability subclass (nonirrigated): 8
Common trees: None
Typical profile: R—0 to 60 inches; unweathered bedrock

5015—Doebay, moist-Cady-Rock outcrop complex, 10 to 30 percent slopes

Map Unit Setting

General landscape: Hills, mountains
Elevation: 0 to 1,600 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Map Unit Composition

Doebay, moist, and similar soils: 40 percent
Cady and similar soils: 35 percent
Rock outcrop: 15 percent
Dissimilar minor component: 10 percent

Characteristics of Doebay, Moist

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): North
Aspect (range): West to east (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 10 to 30 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None

Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 4.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 4e
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Western redcedar–Douglas-fir/salal/swordfern (F002XN903WA)

Common trees
Douglas-fir, bigleaf maple, grand fir, lodgepole pine, red alder, western hemlock, western redcedar

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 6 inches; loam
Bw1—6 to 16 inches; fine sandy loam
Bw2—16 to 21 inches; very gravelly sandy loam
C—21 to 35 inches; extremely gravelly sandy loam
R—35 to 45 inches; unweathered bedrock

Characteristics of Cady

Setting
Landform: Hillslopes, mountain slopes
Aspect (representative): South
Aspect (range): East to west (clockwise)

Properties and qualities
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 10 to 30 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (Ksat): Moderately high or high (see Physical Properties table)
Flooding frequency: None
Ponding frequency: None
Seasonal high water table (minimum depth): More than 72 inches
Available water capacity (entire profile): Low (about 3.7 inches)

Interpretive groups
Land capability subclass (nonirrigated): 6e
Forage suitability group: Limited Depth Soils (G002XN302WA)
Ecological site: Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)

Common trees
Douglas-fir, Garry oak, Pacific madrone, grand fir, lodgepole pine

Typical profile
Oi—0 to 1 inch; slightly decomposed plant material
A—1 to 4 inches; loam
Bw—4 to 16 inches; fine sandy loam
R—16 to 26 inches; unweathered bedrock

Characteristics of Rock Outcrop

Slope range: 10 to 30 percent
Land capability subclass (nonirrigated): 8

Common trees: None
Typical profile: R—0 to 60 inches; unweathered bedrock

Dissimilar Minor Component

Aquic Dystroxerepts, bedrock hills
Percentage of map unit: 10 percent
Landform: Drainageways

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the county. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the county. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Vegetation

Characteristics of the forestland and grassland vegetation in the county are described in this section. Each soil component in the area is assigned an ecological site name and number corresponding to either a forestland or grassland site. They are given in table 5 and in the section “Detailed Soil Map Units.” Each soil component in the county is also assigned a forage suitability group name and number. These groups are discussed under the heading “Crops and Pasture.” They are shown in table 6 and in the section “Detailed Soil Map Units.” Additional information is given in table 8 for each soil in the county that supports forestland.

Table 5 shows, for each soil that supports vegetation suitable for grazing, the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; and the characteristic vegetation. An explanation of the column headings in the table follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical

Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation (the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil) is listed by common name.

Table 5.--Ecological Sites and Characteristic Plant Communities

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
994:				
Urban land.				
995:				
Water, miscellaneous.				
996:				
Dumps.				
997:				
Pits, gravel.				
998:				
Water, saline.				
999:				
Water, fresh.				
1005:				
Shalcar	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
Shalcar, drained	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
Semiahmoo	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
1006:				
Semiahmoo	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
Semiahmoo, drained	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
Shalcar	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
1016:				
Orcas	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
1017:				
Zylstra	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1017:				
Frostad	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable Normal Unfavorable	--- --- ---	Cluster rose Common snowberry Field horsetail Red elderberry Salmonberry Scouringrush horsetail Stinging nettle Trailing blackberry Western swordfern
Frostad, drained	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable Normal Unfavorable	--- --- ---	Cluster rose Common snowberry Field horsetail Red elderberry Salmonberry Scouringrush horsetail Stinging nettle Trailing blackberry Western swordfern
1018:				
Coupeville	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable Normal Unfavorable	--- --- ---	Cluster rose Common snowberry Field horsetail Red elderberry Salmonberry Scouringrush horsetail Stinging nettle Trailing blackberry Western swordfern
Mitchellbay, cool	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable Normal Unfavorable	--- --- ---	Baldhip rose Cascade Oregongrape Evergreen huckleberry Oceanspray Red huckleberry Salal Trailing blackberry Western brackenfern Western swordfern
Coupeville, drained	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable Normal Unfavorable	--- --- ---	Cluster rose Common snowberry Field horsetail Red elderberry Salmonberry Scouringrush horsetail Stinging nettle Trailing blackberry Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1019:				
Morancreek, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Limepoint	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Shalcar	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
1020:				
Sholander, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Limepoint	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Shalcar	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
1021:				
Sholander, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1021:				
Spieden	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Spieden, drained	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Sucia, cool	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
1022:				
Coveland, cool	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Coveland, cool, drained	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Coupeville	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1022:				
Sucia, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
1023:				
Coupeville	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Coupeville, drained	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Coveland, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
1024:				
Limepoint	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Sholander, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1024:				
Limepoint, drained	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Shalcar	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
1025:				
Beaches.				
Endoaquents, tidal	LOW SALT MARSH (R002XN713WA)	Favorable	---	Virginia glasswort
		Normal	---	
		Unfavorable	---	
Xerorthents	SALT WATER BLUFF (R002XN702WA)	Favorable	---	Oregon gumweed
		Normal	---	Roemer's fescue
		Unfavorable	---	Common yarrow
				Field chickweed
				Great camas
				Red fescue
1026:				
Coveland, prairie	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
Coveland, prairie, drained	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
Coupeville, prairie	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
Sucia, prairie	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
1027:				
Coupeville, prairie	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1027:				
Coupeville, prairie, drained	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
Coveland, prairie	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
1028:				
Orcas, drained	BOG OR FEN (R002XN603WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
1051:				
Coupeville, prairie	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
Ebeys	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
Coupeville, prairie, drained	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
1052:				
Ebeys	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
Coupeville, prairie	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
Coupeville, prairie, drained	WET PRAIRIE (R002XN613WA)	Favorable	1,800	
		Normal	1,500	
		Unfavorable	1,200	
1053:				
Dugualla	HIGH SALT MARSH (R002XN703WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1053:				
Dugualla, protected------	HIGH SALT MARSH (R002XN703WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
Endoaquents, tidal----------	LOW SALT MARSH (R002XN713WA)	Favorable	---	Virginia glasswort
		Normal	---	
		Unfavorable	---	
1054:				
Puget, drained--	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Endoaquents, tidal----------	LOW SALT MARSH (R002XN713WA)	Favorable	---	Virginia glasswort
		Normal	---	
		Unfavorable	---	
Xerorthents-----	SALT WATER BLUFF (R002XN702WA)	Favorable	---	Oregon gumweed
		Normal	---	Roemer’s fescue
		Unfavorable	---	Common yarrow
				Field chickweed
				Great camas
				Red fescue
1055:				
Urban land.				
Coupeville------	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Coveland--------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
1055:				
Hoypus	Douglas-fir–Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Whidbey	Douglas-fir–Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
2000:				
Whidbey	Douglas-fir–Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Hoypus	Douglas-fir–Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
2010:				
Whidbey	Douglas-fir–Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
2010:				
Hoypus----------	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
2012:				
Elwha-----------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Zylstra---------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Morancreek, cool	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Everett---------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
2013:				
Zylstra---------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
2013:				
Frostad---------	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
Elwha-----------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
2016:				
Zylstra---------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Alderwood-------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Everett---------	Western hemlock-western redcedar/red huckleberry- salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Frostad---------	Sitka spruce-red alder/ salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
2017:				
Bozarth	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
Pilepoint	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,600	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
2018:				
Sucia, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Sholander, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
2019:				
Mitchellbay, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Coupeville	Sitka spruce-red alder/salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
2023:				
Sucia, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable Normal Unfavorable	--- --- ---	Baldhip rose Cascade Oregongrape Evergreen huckleberry Oceanspray Red huckleberry Salal Trailing blackberry Western brackenfern Western swordfern
Sholander, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable Normal Unfavorable	--- --- ---	Baldhip rose Cascade Oregongrape Evergreen huckleberry Oceanspray Red huckleberry Salal Trailing blackberry Western brackenfern Western swordfern
Spieden	Sitka spruce-red alder/salmonberry/field horsetail (F002XN904WA)	Favorable Normal Unfavorable	--- --- ---	Cluster rose Common snowberry Field horsetail Red elderberry Salmonberry Scouringrush horsetail Stinging nettle Trailing blackberry Western swordfern
2024:				
Indianola	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable Normal Unfavorable	--- --- ---	Baldhip rose Cascade Oregongrape Evergreen huckleberry Oceanspray Red huckleberry Salal Trailing blackberry Western brackenfern Western swordfern
Uselessbay	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable Normal Unfavorable	--- --- ---	Baldhip rose Cascade Oregongrape Evergreen huckleberry Oceanspray Red huckleberry Salal Trailing blackberry Western brackenfern Western swordfern
Utsalady	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable Normal Unfavorable	--- --- ---	Baldhip rose Cascade Oregongrape Evergreen huckleberry Oceanspray Red huckleberry Salal Trailing blackberry Western brackenfern Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
2025:				
Utsalady--------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Uselessbay------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Spieden---------	Sitka spruce-red alder/salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
2026:				
Uselessbay------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Utsalady--------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Spieden---------	Sitka spruce-red alder/salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
2027:				
Utsalady	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Uselessbay	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Spieden	Sitka spruce-red alder/salmonberry/field horsetail (F002XN904WA)	Favorable	---	Cluster rose
		Normal	---	Common snowberry
		Unfavorable	---	Field horsetail
				Red elderberry
				Salmonberry
				Scouringrush horsetail
				Stinging nettle
				Trailing blackberry
				Western swordfern
2052:				
Townsend	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
San Juan	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
2054:				
Zylstra	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
2054:				
Mitchellbay, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
2055:				
Zylstra	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Mitchellbay, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3001:				
Hoypus	Douglas-fir-Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
3003:				
Keystone	Douglas-fir-Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
3003:				
Utsalady--------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Sucia, cool-----	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3005:				
San Juan--------	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
3007:				
San Juan--------	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
3008:				
Xerorthents-----	SALT WATER BLUFF (R002XN702WA)	Favorable	---	Oregon gumweed
		Normal	---	Roemer's fescue
		Unfavorable	---	Common yarrow
				Field chickweed
				Great camas
				Red fescue
Endoaquents, tidal----------	LOW SALT MARSH (R002XN713WA)	Favorable	---	Virginia glasswort
		Normal	---	
		Unfavorable	---	
Beaches.				

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
3011:				
Everett---------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Alderwood-------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3017:				
Everett---------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Alderwood-------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3018:				
Everett---------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3019:				
Everett---------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
3019:				
Alderwood-------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Morancreek, cool	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3020:				
Indianola-------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3021:				
Indianola-------	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3022:				
Aquic Dystroxerepts, coastal bluffs	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
3022:				
Oxyaquic Xerorthents	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Beaches.				
3024:				
Indianola	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3050:				
Hoypus	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
3051:				
Snakelum	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer’s fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
San Juan	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer’s fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
3052:				
Everett	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
Hoypus	Douglas-fir-Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Utsalady	Western hemlock-western redcedar/red huckleberry-salal/western swordfern (F002XN906WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Evergreen huckleberry
				Oceanspray
				Red huckleberry
				Salal
				Trailing blackberry
				Western brackenfern
				Western swordfern
3053:				
Bozarth	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer’s fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
Ebeys	XERIC PRAIRIE (R002XN502WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer’s fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
3054:				
Hoypus	Douglas-fir-Pacific madrone/oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
5000:				
Cady	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Rock outcrop.				
Doebay	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Killebrew	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
5001:				
Rock outcrop.				
Haro	PRAIRIE BALD (R002XN202WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
Hiddenridge	PRAIRIE BALD (R002XN202WA)	Favorable	---	
		Normal	---	
		Unfavorable	---	
5003:				
Doebay	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
5003:				
Morancreek------	Western redcedar-Douglas-fir/ salal/western swordfern (F002XN903WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Common snowberry
				Oceanspray
				Prickly currant
				Salal
				Salmonberry
				Stinging nettle
				Trailing blackberry
				Western brackenfern
				Western swordfern
Cady------------	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Rock outcrop.				
5006:				
Cady------------	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Doebay----------	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Rock outcrop.				
5007:				
Haro------------	PRAIRIE BALD (R002XN202WA)	Favorable	1,000	California oatgrass
		Normal	650	Oregon white oak
		Unfavorable	500	Roemer's fescue
				Camas
				Common yarrow
				Field chickweed
				Prairie Junegrass

Table 5.--Ecological Sites and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production: Kind of year	Total production: Dry Weight	Characteristic vegetation
			Lb/acre	
5007:				
Hiddenridge-----	PRAIRIE BALD (R002XN202WA)	Favorable	1,800	Oregon white oak
		Normal	1,500	Roemer's fescue
		Unfavorable	1,200	Blue wildrye
				Camas
				Common yarrow
				Field chickweed
				Slender wheatgrass
Rock outcrop.				
5015:				
Doebay, moist---	Western redcedar-Douglas-fir/ salal/western swordfern (F002XN903WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Common snowberry
				Oceanspray
				Prickly currant
				Salal
				Salmonberry
				Stinging nettle
				Trailing blackberry
				Western brackenfern
				Western swordfern
Cady------------	Douglas-fir-Pacific madrone/ oceanspray/western rattlesnake plantain (F002XN901WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Northern twinflower
				Oceanspray
				Orange honeysuckle
				Salal
				Trailing blackberry
				Western brackenfern
				Western rattlesnake plantain
				Western swordfern
Rock outcrop.				
Aquic Dystroxerepts, bedrock hills--	Western redcedar-Douglas-fir/ salal/western swordfern (F002XN903WA)	Favorable	---	Baldhip rose
		Normal	---	Cascade Oregongrape
		Unfavorable	---	Common snowberry
				Oceanspray
				Prickly currant
				Salal
				Salmonberry
				Stinging nettle
				Trailing blackberry
				Western brackenfern
				Western swordfern

Forestland Vegetation

By Kathryn E. Smith, forester, Natural Resources Conservation Service.

Forested landscapes are assigned to ecological sites for the purposes of inventory, evaluation, and management. An ecological site is a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. An ecological site is the product of all the environmental factors responsible for its development and has a set of key characteristics, which are included in the ecological site description. Ecological sites have characteristic soils that have developed over time. The factors of soil development are climate, living organisms, topography or landscape position, parent material, and time.

All ecological sites have a historic climax plant community (HCPC), which is the basis for classifying each site. The HCPC is defined as the plant community that existed prior to European immigration and settlement. It is the plant community that developed as a result of all the site-forming factors and was best adapted to the combination of environmental factors associated with the site. The HCPC is in dynamic equilibrium with its environment.

The process of plant community development is known as succession. Succession occurs over time and is the result of climate, soil properties, plant growth, and natural disturbances. Plant succession is defined as the progressive replacement of plant communities on an ecological site that tends toward establishment of the HCPC. A severe natural climatic event or management by man can result in progression of the vegetation away from the HCPC.

The name and identification number and a summary of each of the major forestland ecological sites in the county are given in the following paragraphs.

***Pseudotsuga menziesii–Arbutus menziesii/Holodiscus discolor/Goodyera oblongifolia* (Douglas-fir–Pacific madrone/oceanspray/western rattlesnake plantain) (F002XN901WA)**.—Areas of this site are mainly on south-facing slopes or in flat areas with droughty soils. Temperatures are warm in summer and the soils generally have a low moisture content during this time; therefore, this is the hottest and driest conifer site. Natural disturbances such as fires and windstorms have played a role in the development of this site as have human activities such as timber harvesting and conversion to cropland. The historical fire regime appears to be one of low to moderate intensity fires at a frequency of 30 to 100 years. Douglas-fir (*Pseudotsuga menziesii*) is the dominant tree species in the historic climax plant community. Pacific madrone (*Arbutus menziesii*) becomes established as a minor component in some areas and as a major component in a few areas. As Douglas-fir ages, it can withstand more intense fires. Following fire or other stresses, the trees generally produce copious amounts of seed. Over time, several age classes of Douglas-fir develop in the forest. Pacific madrone, a thin-barked species, will be top-killed by fire but can sprout prolifically from underground burls if it receives adequate sunlight. Pacific madrone also favors a mineral soil for seedling establishment, thus competing with coniferous seedlings. If Douglas-fir does not reoccupy the site quickly, Pacific madrone can become a major component of the plant community as can oceanspray. If a seed source is present, lodgepole pine (*Pinus contorta*) will also become established. The diversity and abundance of the understory vegetation varies with the state of the overstory. It can include oceanspray (*Holodiscus discolor*), baldhip rose (*Rosa gymnocarpa*), salal (*Gaultheria shallon*), dull Oregon-grape (*Mahonia nervosa*), western rattlesnake plantain (*Goodyera oblongifolia*), trailing blackberry (*Rubus ursinus*), and western brackenfern (*Pteridium aquilinum*).

***Thuja plicata–Pseudotsuga menziesii/Gaultheria shallon/Polystichum munitum* (western redcedar–Douglas-fir/salal/western swordfern) (F002XN903WA).**—Western redcedar is the dominant overstory species for this

somewhat moist to moist ecological site, and Douglas-fir commonly is co-dominant. Grand fir, red alder, western hemlock, lodgepole pine, and bigleaf maple may be present but only as minor components. In the absence of a major disturbance, the heavy shade of western redcedar forests favors the gradual replacement of Douglas-fir with the more shade-tolerant redcedar. The most common natural disturbance on this site is windthrow in small pockets of overstory trees. The resulting openings in the canopy allow some sunlight to reach the forest floor, which benefits the normally sparse understory. The historic fire regime was one of low frequency (150 to 300 years or more) and moderate to high intensity. These fires are, in effect, stand-replacing, although individual trees survive, providing a seed source. The understory commonly is sparse, especially in mid-successional stands (50 to 150 years), because of the canopy of redcedar. Western swordfern is the most common understory species, but salal, baldhip rose, snowberry, cascade Oregongrape, and stinging nettle also are included in the understory.

***Picea sitchensis–Alnus rubra/Rubus spectabilis/Equisetum arvense* (Sitka spruce–red alder/salmonberry/field horsetail) (F002XN904WA)**.—This site is in very moist or wet areas, such as low swales, where soil moisture is influenced by the depth to the water table (Ebey’s and Crockett Prairies), and in other areas of poorly drained soils. The historic climax overstory in most areas is dominantly Sitka spruce (*Picea sitchensis*) interspersed with red alder (*Alnus rubra*). Both alder and spruce will seed quickly when a mineral soil is exposed, with spruce becoming dominant when growth of the alder slows, usually after more than 70 years. Grand fir (*Abies grandis*), western redcedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*) may be in these forests, but only in slightly higher and drier microsites. The major disturbances are windthrow of Sitka spruce and rot-induced stem breakage of red alder, both of which lead to an increase in the amount of sunlight reaching the forest floor. Windthrow also exposes the mineral soil, allowing for regeneration of both spruce and alder. Common understory species are field and scouringrush horsetail (*Equisetum arvense* and *E. hyemale*), salmonberry (*Rubus spectabilis*), red elderberry (*Sambucus racemosa*), western swordfern (*Polystichum munitum*), trailing blackberry (*Rubus ursinus*), snowberry (*Symphoricarpos albus*), and stinging nettle (*Urtica dioica*). In a few areas, such as in Ebey’s Prairie, it appears that Native Americans altered the vegetation through burning, creating a nonforested plant community. Because these originally wet prairies have been drained and cultivated for more than a century, it is not clear what vegetation evolved under the frequent burning regime.

***Tsuga heterophylla–Thuja plicata/Vaccinium parvifolium–Gaultheria shallon/Polystichum munitum* (western hemlock–western redcedar/red huckleberry–salal/western swordfern) (F002XN906WA)—**This is the most common upland forest site in Island County. Western hemlock *(Tsuga heterophylla)* and/or western redcedar *(Thuja plicata)* are the dominant overstory species for this somewhat moist to moist site, and Douglas-fir *(Pseudotsuga menziesii)* commonly is co-dominant. Grand fir *(Abies grandis)*, red alder *(Alnus rubra)*, lodgepole pine *(Pinus contorta)*, and bigleaf maple *(Acer macrophyllum)* may be present as minor components. The heavy shade of a hemlock/redcedar forest favors the gradual replacement of Douglas-fir with these more shade-tolerant trees in the absence of a major disturbance. The most common natural disturbance on this site is windthrow in small pockets of overstory trees. The resulting openings in the canopy allow some sunlight to reach the forest floor, which is beneficial to the normally sparse understory. The historic fire regime was one of low frequency (150 to more than 300 years) and moderate to high intensity. The fires were, in effect, stand replacing, although individual trees survived, providing a seed source. The understory in these forests commonly is sparse, especially in mid-successional stands (75 to 150 years) because of the dense canopy. Western swordfern (*Polystichum munitum*) generally is the most common understory species. Red huckleberry (*Vaccinium parvifolium*), evergreen huckleberry (*Vaccinium ovatum*),

salal (*Gaultheria shallon*), trailing blackberry (*Rubus ursinus*), baldhip rose (*Rosa gymnocarpa*), dull Oregon-grape (*Mahonia nervosa*), oceanspray (*Holodiscus discolor*), and western brackenfern (*Pteridium aquilinum*) are also common on this site.

Grassland Vegetation

By Marty Chaney, area agronomist, Natural Resources Conservation Service.

Grassland in the county is comprised of sites that support native grasses and forbs and those that have been converted from native prairies or forestland to tilled and seeded pasture that supports introduced forage species. Native prairies and introduced grassland communities are subject to both biotic and abiotic pressures. Fire, caused by both humans and lightning, was an influence on the development of all of the prairies, regardless of their location. Human-caused fires were periodic and were used to stimulate the growth of carbohydrate-rich forbs harvested by Native American tribes in the area. Wild game were also attracted to the area by the regrowth of nutritious grasses and forbs. Fire also controlled the invasion of woody plants, which can out-compete and replace grasses and forbs as the dominant species. Human influence continues to be a major factor affecting the grassland communities. Farming, livestock grazing, conversion to woodland, reduction of fire, removal of active management, and development of homesites all have a significant effect on both native and introduced grassland communities.

The major abiotic factors influencing these plant communities include prevailing winds, which can maintain a cooler local microclimate and affect soil temperatures; proximity to marine waters, which can also result in cooling of the local microclimate; aspect, which can cause the local microclimate to be either warmer and drier (south and west slopes) or cooler and wetter (north and east slopes); elevation, which affects the average daily high and low temperatures, as they decrease with increasing elevation; and soil properties, such as texture and available water capacity. Precipitation also has a major influence on these plant communities. The county is in the rainshadow of the Olympic Mountains; thus, it receives significantly less precipitation than the mainland to the east and south. This not only influences species survival, but it also affects the local growing season. The soils warm up more quickly in spring with the reduced amount of cold rain, but the growing season can also be shorter in areas of shallow or sandy soils because less moisture is available in summer.

The name and identification number and a summary of the major native grassland communities in the county are given in the following paragraphs. The biotic and abiotic factors present at any time can cause transitions, either abrupt or gradual, from one plant community, or state, to another. Sometimes these transitions are gradual, and the effects can be reversed by merely ceasing the activity causing the transition pressure. Often the transitions are abrupt, such those caused by fire or tillage, and only a major input of energy, such as mechanical activity or use of chemicals, can cause the community to return to its previous state. Once the desired plant community is reestablished, the community will once again transition to a different, commonly less desirable, plant community unless all of the factors causing the transition pressure, both gradual and abrupt, are addressed.

PRAIRIE BALD – FEIDR/CAQU/(QUGA4) (R002XN202WA).—The soils that support this native plant community typically are on south- or west-facing slopes and are in complex with stringers of deeper soils and areas of Rock outcrop. The soils generally are shallow and have a dark-colored A horizon. Typical soils include the Haro and Hiddenridge series. Areas of this site were historically kept free of extensive brush and tree cover by burning. Typical native plant species on the site include Roemer's fescue (*Festuca roemeri*), camas (*Camassia quamash*), prairie Junegrass (*Koeleria macrantha*), California oatgrass (*Danthonia californica*), field chickweed (*Cerastium*

arvense ssp strictum), and Oregon white oak (*Quercus garryana*). In some areas, the soils are influenced by various abiotic factors such as prevailing winds (especially across marine waters), proximity to unprotected marine waters, and elevation. In these areas, the soils are cooler than is typical for the soil series. These areas are referred to as the cold phase in the ecological site description. The effect of this cooler regime on the plant community is generally the absence of Oregon white oak.

XERIC PRAIRIE – FEIDR/CAQU/(QUGA4) (ROO2XN502WA).—The soils that support this native plant community typically are on outwash plains. The soils are generally deep or very deep, are coarse-textured, have good internal drainage, and have a thick, dark-colored A horizon in the upper part of the soil profile. They commonly have a significant amount of sand. Areas of this site were historically kept free of extensive brush and tree cover by burning. Typical soils include the Snakelum, San Juan, and Ebeys series. Typical native plant species on the site include Roemer's fescue (*Festuca idahoenis v. roemeri*), camas (*Camassia quamash*), blue wildrye (*Elymus glaucus*), slender wheatgrass (*Elymus trachycaulus*), field chickweed (*Cerastium arvense ssp strictum*), and Oregon white oak (*Quercus garryana*). Generally, oak is on aspects protected from strong marine winds and it regenerates slowly. In some areas, the soils are influenced by various abiotic factors such as prevailing winds (especially across marine waters), proximity to unprotected marine waters, and elevation. In these areas, the soils are cooler than is typical for the soil series. These areas are referred to as the cold phase in the ecological site description. The effect of this cooler regime on the plant community is generally the absence of Oregon white oak.

BOG or FEN – LEGR/GASH/SPDO/CAREX/PICOC (ROO2XN603WA).—The soils that support this native plant community typically are in depressional areas and have an accumulation of undecomposed or partially decomposed organic matter. The soils generally have a water table at or near the soil surface for much of the winter and spring, and the water table commonly is at the soil surface or within a few feet of the surface for the rest of the year. These soils typically are nutrient poor and are acidic. Typical soils are those of the Semiahmoo series. These areas historically may have been kept free of extensive brush and tree cover by burning. Typical native plant species include Labrador tea (*Ledum groenlandicum*), salal (*Gaultheria shalon*), spirea (*Spiraea douglasii*), sedges (*Carex spp.*), and minor amounts of shore pine (*Pinus contorta*).

WET PRAIRIE – DECE18/CAREX/CALE (ROO2XN613WA).—The soils that support this native plant community typically are in depressional areas and commonly formed in glaciomarine deposits. The soils generally have a water table at or near the soil surface for much of the winter and spring, and the water table commonly is within a few feet of the soil surface for the rest of the year. Typical soils are the prairie phase of the Coupeville series. These areas were historically kept free of extensive brush and tree cover by burning. This ecological site is in areas that are cooler in spring and at night in summer, resulting in fewer available heat units for plant growth and soil warming. Typical native plant species include tufted hairgrass (*Deschampsia caespitosa*), great camas (*Camassia leichtlinii*), and various species of sedge (*Carex spp.*).

SALT WATER BLUFF – FERU2/CALE/LONU2 (ROO2XN702WA).—The soils that support this native plant community typically are on steep bluffs directly above unprotected marine waters. This ecological site may also be on flatter slopes adjacent to or at the toeslopes of bluffs. The soils are generally sandy and droughty and have a dark-colored A horizon in the upper part of the profile. Typical soils are Xerorthents. These soils are influenced by the "cold phase" abiotic factors such as the prevailing winds (especially across marine waters) and proximity to unprotected marine waters, which result in the areas being cooler than is typical for the soils. The effect on the plant community is generally the absence of Oregon white oak (*Quercus garryana*).

As compared to other native prairie plant communities, this plant community generally exhibits an increase in the abundance of red fescue (*Festuca rubra*) with a related reduction in the abundance of Roemer's fescue (*Festuca roemeri*). Other common native plants are barestem desert parsley (*Lomatium nudicaule*) and great camas (*Camassia leichtlinii*).

HIGH SALT MARSH – LEMO8/DECE18/GRST (ROO2XN703WA).—The soils that support this native plant community typically are adjacent to marine waters and are affected by extreme high tides and intrusions of saltwater. This plant community is immediately adjacent to and higher in elevation than the low salt marsh plant community. The soils characteristically are nearly level and have an internal water table very close to the soil surface year round. Typical soils are those of the Dugualla series. This ecological site is in areas that are cooler than the rest of the immediate Puget Trough area because they are exposed to the prevailing winds from across unprotected marine waters. Typical native plant species include American dunegrass (*Leymus mollis*), tufted hairgrass (*Deschampsia caespitosa*), red fescue (*Festuca rubra*), Oregon gumweed (*Grindellia stricta*), Douglas aster (*Aster subspicatus*), fat hen (*Atriplex patula*), and Pacific silverweed (*Potentilla pacifica*).

LOW SALT MARSH – DISP/SALIC (ROO2XN713WA).—The soils that support this native plant community typically are adjacent to marine waters and are affected by daily high tides and intrusions of saltwater. These soils characteristically are nearly level and have an internal water table very close to the soil surface year round. Typical soils are Endoaquents. This ecological site is immediately adjacent to and at a lower elevation than the high salt marsh site. It is in areas that are cooler than the rest of the immediate Puget Trough area because they are exposed to the prevailing winds from across unprotected marine waters. Typical native plant species include saltgrass (*Distichlis spicata*), Seaside arrowgrass (*Triglochin maritimum*), Lyngby sedge (*Carex lyngbyei*), pickleweed (*Salicornia virginica*), fat hen (*Atriplex patula*), and Seaside plantain (*Plantago maritime*).

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of grass-legume hay are listed, the forage suitability groups are defined, and the system of land capability classification used by the Natural Resources Conservation Service is explained.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Yields per Acre

The average yields per acre shown in table 6 in this survey are those that can be expected of grass-legume hay under a high level of management. They are expressed as tons per acre. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and

trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for the principal crop. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the county, but estimated yields are not listed because the acreage of such crops is small or the crop is used for seed. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Agricultural Grassland Forage Suitability Groups

Most of the soils in the county will support a vigorous plant community of introduced agricultural grass and forb species. Many of the soils will also support other types of agricultural crops, although restrictions such as slope, available water capacity, and a high water table during the growing season can affect the types of crops that can be grown successfully. Soils that originally supported a native plant community of trees and shrubs will usually also support a vigorous community of these agricultural species after they have been cleared, tilled, drained if necessary, and seeded. Commonly, soil amendments such as lime and fertilizer are needed until the plant community is established. These amendments are also needed periodically after establishment to maintain the vigor and productivity of the desired forage species. Soils that formed under a native prairie community can be tilled and seeded to introduced grasses, and few additional amendments are needed. Currently, most sites that still support a native prairie plant community also have several non-native species in the plant community. Management of these mixed communities influences the dominance of a particular suite of species, either native or introduced.

A forage suitability group is a particular type of ecological site assigned to soils that have similar forage species adaptation, production potential, and management needs. The forage suitability group can be used as a planning tool for selection of species and management practices, management options, forage production levels, and recommended initial stocking rates. Forage suitability group descriptions include the practices needed to manage and maintain a vigorous, productive grassland community of adapted introduced agricultural grasses and forbs. The soils in the county have been are assigned to a forage suitability group. Some of the soils in the area support native prairie vegetation, and some have been converted to introduced grasses and forbs. The forage suitability groups can be used to better understand the plant communities in order to either encourage vigorous growth and maintenance or to maintain a less vigorous state so that native grasses and forbs can co-exist or increase in dominance on a site.

A summary of the forage suitability groups included in the county is given in the following paragraphs. The forage suitability group for each soil in the county that supports forage species is given in the section “Detailed Soil Map Units” and in table 6. More detailed information on the forage suitability groups can be obtained from the “National Range and Pasture Handbook” (http://www.glti.nrcs.usda.gov/technical/publications/nrph.html).

Wet Soils (G002XN102WA).—These soils typically have a high water table (less than 6 inches below the soil surface) for a significant portion of the year.

Use of these soils is severely limited by the period of saturation, which occurs as early as October to as late as June. These soils may not be suitable for traffic by livestock or equipment for 1 to 2 months after most other soils (April to June). Saturation of a particular site is influenced by topography, soil texture, and surrounding

land uses, so each pasture must be evaluated individually to establish a period of use that will not damage the plants or soil. Delayed grazing or harvesting results in overly mature forage. Intensive grazing or clipping minimizes the selective grazing that commonly occurs. Artificial drainage by use of ditches or subsurface drains can reduce the period of saturation.

Because these soils receive runoff and subsurface flow and have a good available water capacity, the growing season extends through most of the period of drought in summer. Natural soil fertility is high. Because of these factors, yields are high. These soils provide excellent summer pasture when they are no longer saturated.

Seasonally Wet Soils (G002XN202WA).—These soils typically have a seasonal high water table within 12 inches of the soil surface in winter and early in spring.

Use of these soils is limited by the period of saturation. Areas of these soils on flood plains and in depressions may not be suitable for traffic by livestock or equipment until May. Areas of these soils on terraces and slopes are suitable for traffic by mid- to late-April in most years. Saturation of a particular site is influenced by topography, soil texture, and surrounding land uses, so each pasture must be evaluated individually to establish a period of use that will not damage the plants or soil. Delayed grazing or harvest results in overly mature forage. Intensive grazing or clipping minimizes the selective grazing that commonly occurs. Artificial drainage by use of ditches or subsurface drains can minimize the period of saturation.

Because these soils receive runoff and subsurface flow and have a good available water capacity, the growing season extends through most of the period of drought in summer. Areas of these soils on benches and slopes, however, dry out sooner and have a somewhat shorter growing season. Natural soil fertility is high. Because of these factors, yields are high. These soils provide excellent summer pasture when they are no longer saturated.

Limited Depth Soils (G002XN302WA).—These soils typically have a restrictive layer of dense material or bedrock at a depth of 15 to 40 inches below the soil surface.

The impervious layer in the soil can cause a high subsurface water table to develop rapidly during the rainy season. The water table is generally a concern between November and March, although the depth to the water table during this period fluctuates, depending on rainfall and depth to the restrictive layer. Grazing and mechanical traffic when the soils are saturated can cause compaction and damage to the roots and crown of plants. A high water table is less of a problem on soils that have slopes of more than 3 percent, as downslope surface runoff and internal soil drainage allow the water to move offsite more quickly. Commonly, forage production is significantly diminished during June and there is almost no production in July through September. This is due to the limited available water capacity of the soil because of the impervious layer. These soils dry out much earlier than do soils on bottomland or soils that do not have a restrictive layer. The extent is dependent on the depth to the restrictive layer and the texture of the soil above the restrictive layer (finer textured soils hold more moisture).

These soils commonly are good sites for spring and fall pasture because the slope allows the soils to drain more rapidly and livestock can graze early and late forage growth with a minimal risk of soil compaction. Spring growth often starts earlier on these soils, as the soils generally warm up quickly.

Droughty Soils (G002XN402WA).—These soils typically are coarse textured and have a high content of sand and gravel, resulting in low available water capacity of the root zone.

Because of the limited available water capacity, there is a significant decline in forage production early in June and almost no production in July through early in October. There is also an increased risk of leaching of fertilizers and other chemicals below the root zone.

Commonly, these soils are a good site for spring and fall pasture because they rarely are saturated and livestock can graze early and late forage growth with minimal soil compaction. These soils also tend to warm up a little earlier in spring, and the growth of forage commonly starts slightly sooner than it does in areas of more clayey soils. These soils can also be used as winter confinement areas if the pasture is on a gentle slope; however, some damage to plants can occur and supplemental feed is needed.

Moderately Productive Agricultural Soils (G002XN602WA).—These soils typically have moderate available water capacity and moderate slope or tillage restrictions, but they generally do not have a high water table.

These soils have few limitations. Because of the moderate available water capacity, the growing season extends through most of the period of drought in summer, although pastures at the top of a slope or on steeper slopes dry out more quickly. Some soils can become saturated in winter, but generally only for short periods during and immediately after heavy rainfall.

Commonly, these soils are good sites for spring and fall pasture because they generally are saturated for only short periods and livestock can graze early and late forage growth with a minimal risk of soil compaction. These soils can also be used as winter confinement areas if the pasture is on a gentle slope; however, damage to plants will occur and supplemental feed is needed. Spring growth often starts earlier on these soils, as the soils generally warm up quickly.

Sloping to Steep Soils (G002XN702WA).—These soils typically have moderate available water capacity and do not have a high water table, but slopes of more than 8 percent can affect management.

The main limitation on these soils is the difficulty of using equipment on the steeper slopes for practices such as clipping, subsoiling, and reseeding. Uniform distribution of livestock and use of forage can also be difficult because of the slope. Because of the moderate available water capacity, the growing season typically extends through most of the period of drought in summer, although pastures at the top of slopes or on steeper slopes dry out sooner. Some of the soils can become saturated in winter but generally for only short periods during and immediately after periods of heavy rainfall.

Commonly, these soils are good sites for spring and fall pasture because they generally are saturated for only short periods and livestock can graze early and late forage growth with a minimal risk of soil compaction. Spring growth commonly starts earlier on these soils, and the soils generally warm up quickly.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The capability classification of the soils in the county is given in the section “Detailed Soil Map Units” and in table 6.

Table 6.--Forage Suitability Groups, Land Capability, and Forage Yields

(Yields in the "N" columns are for nonirrigated areas; those in the "I" column are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Forage suitability group	Land capability N	Land capability I	Grass-legume hay N
				Tons
994:				
Urban land	---	---	---	---
995:				
Water, miscellaneous	---	8	---	---
996:				
Dumps	---	8	---	---
997:				
Pits, gravel	---	8	---	---
998:				
Water, saline	---	8	---	---
999:				
Water, fresh	---	8	---	---
1005:				
Shalcar	G002XN102WA	5w	5w	3.00
Shalcar, drained	G002XN202WA	5w	5w	6.00
Semiahmoo	G002XN102WA	5w	5w	3.00
1006:				
Semiahmoo	G002XN102WA	5w	5w	3.00
Semiahmoo, drained	G002XN202WA	5w	5w	6.00
Shalcar	G002XN102WA	5w	5w	3.00
1016:				
Orcas	G002XN102WA	5w	5w	3.00
1017:				
Zylstra	G002XN302WA	4w	4w	2.50
Frostad	G002XN102WA	5w	5w	2.00
Frostad, drained	G002XN202WA	4w	4w	3.00
1018:				
Coupeville	G002XN102WA	5w	5w	3.00
Mitchellbay, cool	G002XN202WA	4w	4w	2.50
Coupeville, drained	G002XN202WA	4w	4w	5.00

Table 6.--Forage Suitability Groups, Land Capability, and Forage Yields--Continued

Map symbol and soil name	Forage suitability group	Land capability N	Land capability I	Grass-legume hay N
				Tons
1019:				
Morancreek, cool	G002XN702WA	3w	4e	2.00
Limepoint	G002XN102WA	5w	5w	3.00
Shalcar	G002XN102WA	5w	5w	3.00
1020:				
Sholander, cool	G002XN202WA	4w	4w	2.00
Limepoint	G002XN102WA	5w	5w	3.00
Shalcar	G002XN102WA	5w	5w	3.00
1021:				
Sholander, cool	G002XN202WA	4w	4w	2.00
Spieden	G002XN102WA	5w	5w	2.00
Spieden, drained	G002XN202WA	4w	4w	3.50
Sucia, cool	G002XN402WA	3s	4s	1.50
1022:				
Coveland, cool	G002XN202WA	6w	6w	3.00
Coveland, cool, drained	G002XN202WA	4w	4w	4.00
Coupeville	G002XN102WA	5w	5w	3.00
Sucia, cool	G002XN402WA	3s	3s	1.50
1023:				
Coupeville	G002XN102WA	5w	5w	3.00
Coupeville, drained	G002XN202WA	4w	4w	5.00
Coveland, cool	G002XN202WA	5w	5w	3.00
1024:				
Limepoint	G002XN102WA	5w	5w	3.00
Sholander, cool	G002XN202WA	4w	4w	2.00
Limepoint, drained	G002XN202WA	4w	4w	5.00
Shalcar	G002XN102WA	5w	5w	3.00
1025:				
Beaches	---	8	---	---
Endoaquents, tidal	---	7w	---	---
Xerorthents	---	7s	---	---
1026:				
Coveland, prairie	G002XN202WA	6w	6w	3.00
Coveland, prairie, drained	G002XN202WA	4w	4w	4.00

Table 6.--Forage Suitability Groups, Land Capability, and Forage Yields--Continued

Map symbol and soil name	Forage suitability group	Land capability N	Land capability I	Grass-legume hay N
				Tons
1026:				
Coupeville, prairie-----	G002XN102WA	5w	5w	3.00
Sucia, prairie----------	G002XN402WA	3s	3s	1.50
1027:				
Coupeville, prairie-----	G002XN102WA	5w	5w	3.00
Coupeville, prairie, drained----------------	G002XN202WA	4w	4w	5.00
Coveland, prairie-------	G002XN202WA	5w	5w	3.00
1028:				
Orcas, drained----------	G002XN102WA	5w	5w	3.00
1051:				
Coupeville, prairie-----	G002XN102WA	5w	5w	3.00
Ebeys-------------------	G002XN402WA	3w	4s	2.00
Coupeville, prairie, drained----------------	G002XN202WA	4w	4w	5.00
1052:				
Ebeys-------------------	G002XN402WA	3w	4s	2.00
Coupeville, prairie-----	G002XN102WA	5w	5w	3.00
Coupeville, prairie, drained----------------	G002XN202WA	4w	4w	5.00
1053:				
Dugualla----------------	---	6s	6s	---
Dugualla, protected-----	G002XN102WA	6s	5w	3.00
Endoaquents, tidal------	---	7w	---	---
1054:				
Puget, drained----------	G002XN202WA	3w	3w	5.00
Endoaquents, tidal------	---	7w	---	---
Xerorthents-------------	---	7e	---	---
1055:				
Urban land--------------	---	---	---	---
Coupeville--------------	G002XN102WA	5w	5w	3.00
Coveland----------------	G002XN202WA	6w	6w	3.00
Hoypus------------------	G002XN402WA	3s	4s	1.00
Whidbey-----------------	G002XN402WA	4s	4s	1.00

Table 6.--Forage Suitability Groups, Land Capability, and Forage Yields--Continued

Map symbol and soil name	Forage suitability group	Land capability N	Land capability I	Grass-legume hay N
				Tons
2000:				
Whidbey	G002XN402WA	4s	4s	1.50
Hoypus	G002XN402WA	3s	4s	1.00
2010:				
Whidbey	G002XN402WA	4s	4s	1.50
Hoypus	G002XN402WA	3s	4s	1.00
2012:				
Elwha	G002XN402WA	3s	3e	1.50
Zylstra	G002XN302WA	4w	4w	2.50
Morancreek, cool	G002XN702WA	3w	4e	2.00
Everett	G002XN402WA	4s	4s	1.50
2013:				
Zylstra	G002XN302WA	4w	4w	2.50
Frostad	G002XN102WA	5w	5w	2.00
Elwha	G002XN402WA	3s	3e	1.50
2016:				
Zylstra	G002XN302WA	4w	4w	2.50
Alderwood	G002XN402WA	6s	6s	1.50
Everett	G002XN402WA	4s	4s	1.50
Frostad	G002XN102WA	5w	5w	2.00
2017:				
Bozarth	G002XN602WA	3s	3s	2.50
Pilepoint	G002XN402WA	3w	3w	2.00
2018:				
Sucia, cool	G002XN402WA	3s	4s	1.50
Sholander, cool	G002XN202WA	4w	4w	2.00
2019:				
Mitchellbay, cool	G002XN202WA	4w	4w	2.50
Coupeville	G002XN102WA	5w	5w	3.00
2023:				
Sucia, cool	G002XN402WA	3e	4e	1.50
Sholander, cool	G002XN202WA	4w	4e	2.00
Spieden	G002XN102WA	5w	5w	2.00
2024:				
Indianola	G002XN402WA	3s	4e	1.50

Table 6.--Forage Suitability Groups, Land Capability, and Forage Yields--Continued

Map symbol and soil name	Forage suitability group	Land capability N	Land capability I	Grass-legume hay N
				Tons
2024:				
Uselessbay	G002XN402WA	4s	4e	1.50
Utsalady	G002XN402WA	3e	4e	1.50
2025:				
Utsalady	G002XN402WA	3e	4e	1.50
Uselessbay	G002XN402WA	4s	4e	1.50
Spieden	G002XN102WA	5w	5w	2.00
2026:				
Uselessbay	G002XN402WA	4s	4e	1.50
Utsalady	G002XN402WA	3e	4e	1.50
Spieden	G002XN102WA	5w	5w	2.00
2027:				
Utsalady	G002XN402WA	3e	4e	1.50
Uselessbay	G002XN402WA	4s	4e	1.50
Spieden	G002XN102WA	5w	5w	2.00
2052:				
Townsend	G002XN402WA	4s	5e	2.00
San Juan	G002XN402WA	4s	6e	1.50
2054:				
Zylstra	G002XN302WA	4w	4w	2.00
Mitchellbay, cool	G002XN202WA	4w	4w	2.50
2055:				
Zylstra	G002XN302WA	4w	4w	2.00
Mitchellbay, cool	G002XN202WA	4w	4w	2.50
3001:				
Hoypus	G002XN402WA	3s	6e	1.00
3003:				
Keystone	G002XN402WA	3s	4e	1.50
Utsalady	G002XN402WA	3e	4e	1.50
Sucia, cool	G002XN402WA	3s	6e	1.50
3005:				
San Juan	G002XN402WA	4s	4s	1.50
3007:				
San Juan	G002XN402WA	4s	6e	1.50

Table 6.--Forage Suitability Groups, Land Capability, and Forage Yields--Continued

Map symbol and soil name	Forage suitability group	Land capability N	Land capability I	Grass-legume hay N
				Tons
3008:				
Xerorthents	---	7e	---	---
Endoaquents, tidal	---	7w	---	---
Beaches	---	8	---	---
3011:				
Everett	G002XN402WA	4s	4s	1.50
Alderwood	G002XN402WA	6s	6s	1.50
3017:				
Everett	G002XN402WA	4s	4s	1.50
Alderwood	G002XN402WA	6s	6s	1.50
3018:				
Everett	G002XN402WA	4s	4s	1.50
3019:				
Everett	G002XN402WA	4s	4s	1.50
Alderwood	G002XN402WA	6s	6s	1.50
Morancreek, cool	G002XN702WA	3w	4e	2.00
3020:				
Indianola	G002XN402WA	3s	4e	1.50
3021:				
Indianola	G002XN402WA	3s	4e	1.50
3022:				
Aquic Dystroxerepts, coastal bluffs	---	7e	7e	---
Oxyaquic Xerorthents	---	7e	7e	---
Beaches	---	8	---	---
3024:				
Indianola	G002XN402WA	3s	4e	1.50
3050:				
Hoypus	G002XN402WA	3s	4s	1.00
3051:				
Snakelum	G002XN402WA	4s	4s	2.00
San Juan	G002XN402WA	4s	4s	1.50
3052:				
Everett	G002XN402WA	4e	6e	1.50
Hoypus	G002XN402WA	6e	7e	1.00
Utsalady	G002XN402WA	3e	4e	1.50

Table 6.--Forage Suitability Groups, Land Capability, and Forage Yields--Continued

Map symbol and soil name	Forage suitability group	Land capability N	Land capability I	Grass-legume hay N
				Tons
3053:				
Bozarth	G002XN602WA	3s	3s	2.50
Ebeys	G002XN402WA	3w	4s	2.00
3054:				
Hoypus	G002XN402WA	3s	4s	1.00
5000:				
Cady	G002XN302WA	6s	---	1.00
Rock outcrop	---	8	---	---
Doebay	G002XN302WA	4e	---	1.50
Killebrew	G002XN302WA	6s	---	1.50
5001:				
Rock outcrop	---	8	---	---
Haro	---	7e	---	0.50
Hiddenridge	---	7e	---	1.50
5003:				
Doebay	G002XN302WA	4e	---	1.50
Morancreek	G002XN702WA	3w	4e	2.00
Cady	G002XN302WA	6e	---	1.00
Rock outcrop	---	8	---	---
5006:				
Cady	---	7e	---	1.00
Doebay	---	7e	---	1.50
Rock outcrop	---	8	---	---
5007:				
Haro	G002XN302WA	6s	---	0.50
Hiddenridge	G002XN402WA	4s	---	1.50
Rock outcrop	---	8	---	---
5015:				
Doebay, moist	G002XN302WA	4e	---	1.50
Cady	G002XN302WA	6e	---	1.00
Rock outcrop	---	8	---	---
Aquic Dystroxerepts, bedrock hills	G002XN202WA	6e	---	2.00

Prime Farmland and Other Important Farmland

Table 7 lists the map units in the county that are considered prime farmland and farmland of statewide importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply. About 88,000 acres of the county is considered to be prime farmland, and about 15,500 acres is considered to be farmland of statewide importance.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 8 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

For some soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

In some areas, land that does not meet the criteria for prime is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

Table 7.--Prime and Other Important Farmland

(Only the soils considered prime or important farmland are listed. Urban or built-up
listed are not considered prime or important farmland.)

Map symbol	Map unit name	Farmland
1005	Shalcar muck, 0 to 2 percent slopes	Prime farmland if
1006	Semiahmoo muck, 0 to 2 percent slopes	Prime farmland if
1016	Orcas peat, 0 to 2 percent slopes	Prime farmland if
1017	Zylstra-Frostad complex, 0 to 3 percent slopes	Prime farmland if
1018	Coupeville-Mitchellbay complex, 0 to 5 percent slopes	Prime farmland if
1019	Morancreek, cool-Limepoint complex, 0 to 5 percent slopes	All areas are pri
1020	Sholander-Limepoint complex, 0 to 8 percent slopes	Prime farmland if
1021	Sholander, cool-Spieden complex, 0 to 5 percent slopes	Prime farmland if
1022	Coveland loam, cool, 0 to 5 percent slopes	Prime farmland if
1023	Coupeville loam, cool, 0 to 3 percent slopes	Prime farmland if
1024	Limepoint-Sholander, cool complex, 0 to 5 percent slopes	Prime farmland if
1026	Coveland loam, prairie, 0 to 5 percent slopes	Prime farmland if
1027	Coupeville loam, prairie, 0 to 3 percent slopes	Prime farmland if
1028	Orcas peat, drained, 0 to 2 percent slopes	All areas are pri
1051	Coupeville-Ebeys complex, 0 to 5 percent slopes	Prime farmland if
1052	Ebeys-Coupeville complex, 0 to 5 percent slopes	Prime farmland if
1053	Dugualla muck, 0 to 2 percent slopes	Prime farmland if protected from f frequently flood season
1054	Puget silty clay loam, 0 to 2 percent slopes	Prime farmland if protected from f frequently flood season
2000	Whidbey gravelly loam, 3 to 15 percent slopes	Prime farmland if
2010	Whidbey-Hoypus complex, 2 to 15 percent slopes	Prime farmland if
2012	Elwha-Zylstra-Morancreek, cool, complex, 2 to 12 percent slopes	Prime farmland if
2013	Zylstra-Frostad complex, 0 to 8 percent slopes	Prime farmland if
2017	Bozarth-Pilepoint complex, 2 to 8 percent slopes	Prime farmland if
2018	Sucia loamy sand, cool, 2 to 10 percent slopes	Prime farmland if
2019	Mitchellbay gravelly sandy loam, 2 to 10 percent slopes	All areas are pri
2023	Sucia-Sholander complex, cool, 2 to 15 percent slopes	Farmland of state
2024	Indianola-Uselessbay complex, 5 to 30 percent slopes	Farmland of state
2025	Utsalady-Uselessbay complex, 2 to 12 percent slopes	Prime farmland if
2026	Uselessbay-Utsalady complex, 0 to 10 percent slopes	Prime farmland if
2027	Utsalady-Uselessbay complex, 0 to 5 percent slopes	Prime farmland if
2052	Townsend-San Juan complex, 3 to 15 percent slopes	Farmland of state
2054	Zylstra-Mitchellbay complex, 0 to 5 percent slopes	Prime farmland if
2055	Zylstra-Mitchellbay complex, 2 to 10 percent slopes	Prime farmland if
3001	Hoypus sandy loam, 3 to 25 percent slopes	Farmland of state
3003	Keystone-Utsalady complex, 0 to 3 percent slopes	Prime farmland if

Table 7.--Prime and Other Important Farmland--Continued

Map symbol	Map unit name	Farmland
3005	San Juan sandy loam, 2 to 8 percent slopes	Prime farmland if
3007	San Juan sandy loam, 5 to 20 percent slopes	Farmland of state
3017	Everett-Alderwood complex, 3 to 15 percent slopes	Prime farmland if
3020	Indianola loamy sand, 8 to 25 percent slopes	Farmland of state
3021	Indianola loamy sand, 0 to 5 percent slopes	Prime farmland if
3024	Indianola loamy sand, 3 to 15 percent slopes	Prime farmland if
3050	Hoypus sandy loam, 2 to 8 percent slopes	Prime farmland if
3051	Snakelum sandy loam, 0 to 2 percent slopes	Prime farmland if
3053	Bozarth-Ebeys complex, 0 to 12 percent slopes	Prime farmland if
5003	Doebay-Morancreek complex, 5 to 25 percent slopes	Farmland of state

Forestland Productivity

Table 8 can help forest owners or managers plan the use of soils for wood crops. It shows the potential productivity of the soils for wood crops.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *site index base age* is the number, from the National Register of Site Index Curves, corresponding to the site index curve used to determine the site index and the annual productivity of the tree species.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Table 8.--Forestland Productivity

(Absence of an entry indicates either that the soil typically does not support trees or that the soil may support trees but a sufficient number of trees for site index data collection were not available.)

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
1017:					
Zylstra	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Frostad	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	104	50	125	
	Red alder	68	20	---	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Frostad, drained	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	104	50	125	
	Red alder	68	20	---	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
1018:					
Coupeville	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	82	50	87	
	Red alder	54	20	---	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Mitchellbay, cool	Bigleaf maple	---		---	---
	Douglas-fir	98	50	132	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	117	50	---	
	Red alder	60	20	---	
	Western hemlock	91	50	215	
	Western redcedar	79	50	---	
Coupeville, drained	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	82	50	87	
	Red alder	54	20	---	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
1019:					
Morancreek, cool	Bigleaf maple	---		---	---
	Douglas-fir	104	50	143	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	117	50	---	
	Red alder	60	20	---	
	Western hemlock	91	50	215	
	Western redcedar	82	50	---	
Limepoint	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	60	20	---	
	Red alder	92	50	104	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Shalcar.					
1020:					
Sholander, cool	Bigleaf maple	---		---	---
	Douglas-fir	113	50	160	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	84	50	---	
	Western redcedar	95	50	203	
Limepoint	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	92	50	104	
	Red alder	60	20	---	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Shalcar.					
1021:					
Sholander, cool	Bigleaf maple	---		---	---
	Douglas-fir	113	50	160	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	84	50	---	
	Western redcedar	95	50	203	
Spieden	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	105	50	127	
	Red alder	66	20	---	
	Western hemlock	---		---	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
1021:					
Spieden, drained	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	66	20	---	
	Red alder	105	50	127	
	Western hemlock	---		---	
	Western redcedar	---		---	
Sucia, cool	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
1022:					
Coveland, cool	Bigleaf maple	---		---	---
	Douglas-fir	124	50	182	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	---		---	
	Western redcedar	---		---	
Coveland, cool, drained	Bigleaf maple	---		---	---
	Douglas-fir	124	50	182	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	---		---	
	Western redcedar	---		---	
Coupeville	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Sucia, cool	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
1023:					
Coupeville	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	82	50	87	
	Red alder	54	20	---	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Coupeville, drained	Bigleaf maple	---		---	---
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Coveland, cool	Bigleaf maple	---		---	---
	Douglas-fir	124	50	182	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	---		---	
	Western redcedar	---		---	
1024:					
Limepoint	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	60	20	---	
	Red alder	92	50	104	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Sholander, cool	Bigleaf maple	---		---	---
	Douglas-fir	113	50	160	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	84	50	---	
	Western redcedar	95	50	203	
Limepoint, drained	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	92	50	104	
	Red alder	60	20	---	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Shalcar.					

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
1054:					
Puget, drained	Grand fir	---		---	Red alder, western redcedar
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Endoaquents, tidal.					
Xerorthents.					
1055:					
Urban land.					
Coupeville	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Coveland	Bigleaf maple	---		---	---
	Douglas-fir	124	50	182	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	82	50	87	
	Red alder	54	20	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Hoypus	Douglas-fir	76	50	90	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	86	100	100	
	Pacific madrone	---		---	
Whidbey	Douglas-fir	77	50	92	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	76	100	81	
	Pacific madrone	---		---	
2000:					
Whidbey	Douglas-fir	77	50	92	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	76	100	81	
	Pacific madrone	---		---	
Hoypus	Douglas-fir	76	50	90	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	86	100	100	
	Pacific madrone	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
2010:					
Whidbey------------------	Douglas-fir---------	77	50	92	---
	Garry oak-----------	---		---	
	Grand fir-----------	---		---	
	Lodgepole pine------	76	100	81	
	Pacific madrone-----	---		---	
Hoypus-------------------	Douglas-fir---------	76	50	90	---
	Garry oak-----------	---		---	
	Grand fir-----------	---		---	
	Lodgepole pine------	86	100	100	
	Pacific madrone-----	---		---	
2012:					
Elwha--------------------	Bigleaf maple-------	---		---	---
	Douglas-fir---------	119	50	173	
	Grand fir-----------	---		---	
	Lodgepole pine------	---		---	
	Red alder-----------	54	20	---	
	Red alder-----------	82	50	87	
	Western hemlock-----	87	50	208	
	Western redcedar----	---		---	
Zylstra------------------	Bigleaf maple-------	---		---	---
	Douglas-fir---------	---		---	
	Grand fir-----------	---		---	
	Lodgepole pine------	---		---	
	Red alder-----------	68	50	63	
	Red alder-----------	44	20	---	
	Western hemlock-----	87	50	208	
	Western redcedar----	---		---	
Morancreek, cool---------	Bigleaf maple-------	---		---	---
	Douglas-fir---------	104	50	143	
	Grand fir-----------	---		---	
	Lodgepole pine------	---		---	
	Red alder-----------	117	50	---	
	Red alder-----------	60	20	---	
	Western hemlock-----	91	50	215	
	Western redcedar----	82	50	---	
Everett------------------	Bigleaf maple-------	---		---	---
	Douglas-fir---------	105	50	145	
	Grand fir-----------	---		---	
	Lodgepole pine------	---		---	
	Red alder-----------	82	50	87	
	Red alder-----------	54	20	---	
	Western hemlock-----	87	50	208	
	Western redcedar----	---		---	
2013:					
Zylstra------------------	Bigleaf maple-------	---		---	---
	Douglas-fir---------	---		---	
	Grand fir-----------	---		---	
	Lodgepole pine------	---		---	
	Red alder-----------	68	50	63	
	Red alder-----------	44	20	---	
	Western hemlock-----	87	50	208	
	Western redcedar----	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
2013:					
Frostad	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	104	50	125	
	Red alder	68	20	---	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Elwha	Bigleaf maple	---		---	---
	Douglas-fir	119	50	173	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
2016:					
Zylstra	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Alderwood	Bigleaf maple	---		---	---
	Douglas-fir	101	50	138	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	91	50	102	
	Red alder	60	20	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Everett	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Frostad	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	104	50	125	
	Red alder	68	20	---	
	Sitka spruce	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
2018:					
Sucia, cool	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Sholander, cool	Bigleaf maple	---		---	---
	Douglas-fir	113	50	160	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	84	50	---	
	Western redcedar	95	50	203	
2019:					
Mitchellbay, cool	Bigleaf maple	---		---	---
	Douglas-fir	98	50	132	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	117	50	---	
	Red alder	60	20	---	
	Western hemlock	91	50	215	
	Western redcedar	79	50	---	
Coupeville	Grand fir	---		---	---
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Sitka spruce	116	100	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
2023:					
Sucia, cool	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Sholander, cool	Bigleaf maple	---		---	---
	Douglas-fir	113	50	160	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	84	50	---	
	Western redcedar	95	50	203	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
2023:					
Spieden	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	105	50	127	
	Red alder	66	20	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
2024:					
Indianola	Bigleaf maple	---		---	---
	Douglas-fir	108	50	150	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	86	50	206	
	Western redcedar	79	50	---	
Uselessbay	Bigleaf maple	---		---	---
	Douglas-fir	119	50	173	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Utsalady	Bigleaf maple	---		---	---
	Douglas-fir	110	50	154	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
2025:					
Utsalady	Bigleaf maple	---		---	---
	Douglas-fir	110	50	154	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Uselessbay	Bigleaf maple	---		---	---
	Douglas-fir	119	50	173	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Spieden	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	66	20	---	
	Red alder	105	50	127	
	Western hemlock	---		---	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
2026:					
Uselessbay	Bigleaf maple	---		---	---
	Douglas-fir	119	50	173	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Utsalady	Bigleaf maple	---		---	---
	Douglas-fir	110	50	154	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Spieden	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	105	50	127	
	Red alder	66	20	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
2027:					
Utsalady	Bigleaf maple	---		---	---
	Douglas-fir	110	50	154	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Uselessbay	Bigleaf maple	---		---	---
	Douglas-fir	119	50	173	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Spieden	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	66	20	---	
	Red alder	105	50	127	
	Western hemlock	---		---	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
2054:					
Zylstra	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Mitchellbay, cool	Bigleaf maple	---		---	---
	Douglas-fir	98	50	132	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	60	20	---	
	Red alder	117	50	---	
	Western hemlock	91	50	215	
	Western redcedar	79	50	---	
2055:					
Zylstra	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Mitchellbay, cool	Bigleaf maple	---		---	---
	Douglas-fir	98	50	132	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	60	20	---	
	Red alder	117	50	---	
	Western hemlock	91	50	215	
	Western redcedar	79	50	---	
3001:					
Hoypus	Douglas-fir	76	50	90	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	86	100	100	
	Pacific madrone	---		---	
3003:					
Keystone	Douglas-fir	95	50	125	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	90	100	108	
	Pacific madrone	---		---	
Utsalady	Bigleaf maple	---		---	---
	Douglas-fir	110	50	154	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
3003:					
Sucia, cool	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	44	20	---	
	Red alder	68	50	63	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
3011:					
Everett	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Alderwood	Bigleaf maple	---		---	---
	Douglas-fir	101	50	138	
	Grand fir	---		---	
	Red alder	60	20	---	
	Red alder	91	50	102	
	Western hemlock	---		---	
	Western redcedar	---		---	
3017:					
Everett	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Alderwood	Bigleaf maple	---		---	---
	Douglas-fir	101	50	138	
	Grand fir	---		---	
	Red alder	60	20	---	
	Red alder	91	50	102	
	Western hemlock	---		---	
	Western redcedar	---		---	
3018:					
Everett	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	82	50	87	
	Red alder	54	20	---	
	Western hemlock	87	50	208	
	Western redcedar	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
3019:					
Everett	Bigleaf maple	---		---	---
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	82	50	87	
	Red alder	54	20	---	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Alderwood	Bigleaf maple	---		---	---
	Douglas-fir	101	50	138	
	Grand fir	---		---	
	Red alder	91	50	102	
	Red alder	60	20	---	
	Western hemlock	---		---	
	Western redcedar	---		---	
Morancreek, cool	Bigleaf maple	---		---	---
	Douglas-fir	104	50	143	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	60	20	---	
	Red alder	117	50	---	
	Western hemlock	91	50	215	
	Western redcedar	82	50	---	
3020:					
Indianola	Bigleaf maple	---		---	---
	Douglas-fir	108	50	150	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	86	50	206	
	Western redcedar	79	50	---	
3021:					
Indianola	Bigleaf maple	---		---	---
	Douglas-fir	108	50	150	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	86	50	206	
	Western redcedar	79	50	---	
3024:					
Indianola	Bigleaf maple	---		---	---
	Douglas-fir	108	50	150	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	86	50	206	
	Western redcedar	---		---	
3050:					
Hoypus	Douglas-fir	76	50	90	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	86	100	100	
	Pacific madrone	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
3052:					
Everett	Bigleaf maple	---		---	Douglas-fir, western redcedar
	Douglas-fir	105	50	145	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	54	20	---	
	Red alder	82	50	87	
	Western hemlock	87	50	208	
	Western redcedar	---		---	
Hoypus	Douglas-fir	76	50	90	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	86	100	100	
	Pacific madrone	---		---	
Utsalady	Bigleaf maple	---		---	---
	Douglas-fir	110	50	154	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	
3054:					
Hoypus	Douglas-fir	76	50	90	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	86	100	100	
	Pacific madrone	---		---	
5000:					
Cady	Douglas-fir	66	50	71	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	70	100	70	
	Pacific madrone	---		---	
Rock outcrop.					
Doebay	Douglas-fir	80	50	98	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	80	100	88	
	Pacific madrone	---		---	
Killebrew	Douglas-fir	69	50	76	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	86	100	100	
	Pacific madrone	---		---	
5003:					
Doebay	Douglas-fir	80	50	98	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	80	100	88	
	Pacific madrone	---		---	

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Site index base age	Volume of wood fiber (CMAI)	Trees to manage
		Ft	*Yrs*	*Cu ft/ac/yr*	
5003:					
Morancreek	Bigleaf maple	---		---	---
	Douglas-fir	104	50	143	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	117	50	---	
	Red alder	60	20	---	
	Western hemlock	91	50	215	
	Western redcedar	82	50	---	
Cady	Douglas-fir	66	50	71	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	70	100	70	
	Pacific madrone	---		---	
Rock outcrop.					
5006:					
Cady	Douglas-fir	66	50	71	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	70	100	70	
	Pacific madrone	---		---	
Doebay	Douglas-fir	80	50	98	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	80	100	88	
	Pacific madrone	---		---	
Rock outcrop.					
5015:					
Doebay, moist	Bigleaf maple	---		---	---
	Douglas-fir	88	50	113	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	61	50	---	
Cady	Douglas-fir	66	50	71	---
	Garry oak	---		---	
	Grand fir	---		---	
	Lodgepole pine	70	100	70	
	Pacific madrone	---		---	
Rock outcrop.					
Aquic Dystroxerepts, bedrock hills	Bigleaf maple	---		---	---
	Douglas-fir	---		---	
	Grand fir	---		---	
	Lodgepole pine	---		---	
	Red alder	---		---	
	Western hemlock	---		---	
	Western redcedar	---		---	

Hydric Soils

Table 9 lists the hydric rating for the map unit components in the county. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; USDA, 2006).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (Soil Survey Staff, 1999) and “Keys to Soil Taxonomy” (Soil Survey Staff, 2003) and in the “Soil Survey Manual” (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in “Field Indicators of Hydric Soils in the United States” (USDA, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Table 9.--Hydric Soils

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so	
					Hydric criteria code	Meet satura crite
994:						
Urban land	Urban land	100	Unrated	---	---	---
995:						
Water, miscellaneous	Water, miscellaneous	100	Unrated	---	---	---
996:						
Dumps	Dumps	100	Unrated	---	---	---
997:						
Pits, gravel	Pits, gravel	100	Unrated	---	---	---
998:						
Water, saline	Water, saline	100	Unrated	---	---	---
999:						
Water, fresh	Water, fresh	100	Unrated	---	---	---
1005:						
Shalcar muck, 0 to 2 percent slopes	Shalcar	80	Yes	Depressions	1, 3	No
	Shalcar, drained	10	Yes	Depressions	1, 3	No
	Semiahmoo	10	Yes	Depressions	1, 3	No
1006:						
Semiahmoo muck, 0 to 2 percent slopes	Semiahmoo	80	Yes	Depressions	1, 3	No
	Semiahmoo, drained	10	Yes	Depressions	1, 3	No
	Shalcar	10	Yes	Depressions	1, 3	No
1016:						
Orcas peat, 0 to 2 percent slopes	Orcas	100	Yes	Depressions	1, 3	No

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so: Hydric criteria code	Hydric so: Meet satura crite
1017: Zylstra-Frostad complex, 0 to 3 percent slopes	Zylstra	60	No	Hillslopes	---	---
	Frostad	30	Yes	Drainageways, valleys	2B3	Yes
	Frostad, drained	10	Yes	Drainageways, valleys	2B3	Yes
1018: Coupeville-Mitchellbay complex, 0 to 5 percent slopes	Coupeville	50	Yes	Valleys	2B3	Yes
	Mitchellbay, cool	40	No	Valleys	---	---
	Coupeville, drained	10	Yes	Valleys	2B3	Yes
1019: Morancreek, cool-Limepoint complex, 0 to 5 percent slopes	Morancreek, cool	55	No	Hillslopes	---	---
	Limepoint	35	Yes	Valleys, drainageways	2B3	Yes
	Shalcar	10	Yes	Depressions	1, 3	No
1020: Sholander-Limepoint complex, 0 to 8 percent slopes	Sholander, cool	75	No	Valleys	---	---
	Limepoint	20	Yes	Drainageways, valleys	2B3	Yes
	Shalcar	5	Yes	Depressions	1, 3	No

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so… Hydric criteria code	Meet… satura… crite…
1021: Sholander, cool-Spieden complex, 0 to 5 percent slopes	Sholander, cool	45	No	Valleys	---	---
	Spieden	35	Yes	Drainageways	2B3	Yes
	Spieden, drained	10	Yes	Drainageways	2B3	Yes
	Sucia, cool	10	No	Valleys	---	---
1022: Coveland loam, cool, 0 to 5 percent slopes	Coveland, cool	70	Yes	Valleys	2A	Yes
	Coveland, cool, drained	10	Yes	Valleys	2A	Yes
	Coupeville	10	Yes	Valleys	2B3	Yes
	Sucia, cool	10	No	Valleys	---	---
1023: Coupeville loam, cool, 0 to 3 percent slopes	Coupeville	80	Yes	Valleys	2B3	Yes
	Coupeville, drained	10	Yes	Valleys	2B3	Yes
	Coveland, cool	10	Yes	Valleys	2A	Yes
1024: Limepoint-Sholander, cool complex, 0 to 5 percent slopes	Limepoint	60	Yes	Valleys, drainageways	2B3	Yes
	Sholander, cool	20	No	Valleys	---	---
	Limepoint, drained	10	Yes	Valleys, drainageways	2B3	Yes
	Shalcar	10	Yes	Depressions	1, 3	No

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so	
					Hydric criteria code	Meet satura crite
1025:						
Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes	Beaches	50	Unrated	Beaches	---	---
	Endoaquents, tidal	30	Yes	Beaches	2B1	Yes
	Xerorthents	20	No	Hillslopes, beaches	---	---
1026:						
Coveland loam, prairie, 0 to 5 percent slopes	Coveland, prairie	70	Yes	Valleys	2A	Yes
	Coveland, prairie, drained	10	Yes	Valleys	2A	Yes
	Coupeville, prairie	10	Yes	Valleys	2B3	Yes
	Sucia, prairie	10	No	Valleys	---	---
1027:						
Coupeville loam, prairie, 0 to 3 percent slopes	Coupeville, prairie	80	Yes	Valleys	2B3	Yes
	Coupeville, prairie, drained	10	Yes	Valleys	2B3	Yes
	Coveland, prairie	10	Yes	Valleys	2A	Yes
1028:						
Orcas peat, drained, 0 to 2 percent slopes	Orcas, drained	100	Yes	Depressions	1, 3	No

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so	
					Hydric criteria code	Meet satura crite
1051:						
Coupeville-Ebeys complex, 0 to 5 percent slopes	Coupeville, prairie	70	Yes	Valleys	2B3	Yes
	Ebeys	20	No	Hillslopes	---	---
	Coupeville, prairie, drained	10	Yes	Valleys	2B3	Yes
1052:						
Ebeys-Coupeville complex, 0 to 5 percent slopes	Ebeys	70	No	Hillslopes	---	---
	Coupeville, prairie	20	Yes	Valleys	2B3	Yes
	Coupeville, prairie, drained	10	Yes	Valleys	2B3	Yes
1053:						
Dugualla muck, 0 to 2 percent slopes	Dugualla	80	Yes	Depressions, tidal flats	1, 3	No
	Dugualla, protected	10	Yes	Depressions, tidal flats	1, 3	No
	Endoaquents, tidal	10	Yes	Depressions, tidal flats	2B1	Yes
1054:						
Puget silty clay loam, 0 to 2 percent slopes	Puget, drained	90	Yes	Tidal flats	2B3, 3	Yes
	Endoaquents, tidal	5	Yes	Beaches	2B1	Yes
	Xerorthents	5	No	Hillslopes, sea cliffs, beaches	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so[il]	
					Hydric criteria code	Meet[s] satura[tion] crite[ria]
1055: Urban land-Coupeville-Coveland, 0 to 5 percent slopes	Urban land	60	Unrated	---	---	---
	Coupeville	15	Yes	Valleys	2B3	Yes
	Coveland	15	Yes	Valleys	2A	Yes
	Hoypus	5	No	Hillslopes	---	---
	Whidbey	5	No	Hillslopes	---	---
2000: Whidbey gravelly loam, 3 to 15 percent slopes	Whidbey	90	No	Hillslopes	---	---
	Hoypus	10	No	Hillslopes	---	---
2010: Whidbey-Hoypus complex, 2 to 15 percent slopes	Whidbey	60	No	Hillslopes	---	---
	Hoypus	40	No	Hillslopes	---	---
2012: Elwha-Zylstra-Morancreek, cool, complex, 2 to 12 percent slopes	Elwha	40	No	Ridges	---	---
	Zylstra	30	No	Ridges	---	---
	Morancreek, cool	20	No	Hillslopes	---	---
	Everett	10	No	Hillslopes	---	---
2013: Zylstra-Frostad complex, 0 to 8 percent slopes	Zylstra	75	No	Hillslopes	---	---
	Frostad	15	Yes	Drainageways, valleys	2B3	Yes
	Elwha	10	No	Hillslopes	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so	
					Hydric criteria code	Meet satura crite
2016: Zylstra-Alderwood complex, 3 to 30 percent slopes	Zylstra	50	No	Hillslopes	---	---
	Alderwood	30	No	Hillslopes	---	---
	Everett	10	No	Hillslopes	---	---
	Frostad	10	Yes	Drainageways, valleys	2B3	Yes
2017: Bozarth-Pilepoint complex, 2 to 8 percent slopes	Bozarth	50	No	Hillslopes	---	---
	Pilepoint	50	No	Hillslopes	---	---
2018: Sucia loamy sand, cool, 2 to 10 percent slopes	Sucia, cool	90	No	Valleys	---	---
	Sholander, cool	10	No	Valleys	---	---
2019: Mitchellbay gravelly sandy loam, 2 to 10 percent slopes	Mitchellbay, cool	90	No	Hillslopes	---	---
	Coupeville	10	Yes	Valleys	2B3	Yes
2023: Sucia-Sholander complex, cool, 2 to 15 percent slopes	Sucia, cool	50	No	Valleys	---	---
	Sholander, cool	40	No	Valleys	---	---
	Spieden	10	Yes	Drainageways	2B3	Yes
2024: Indianola-Uselessbay complex, 5 to 30 percent slopes	Indianola	55	No	Hillslopes	---	---
	Uselessbay	35	No	Ridges	---	---
	Utsalady	10	No	Ridges	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so	
					Hydric criteria code	Meet satura crite
2025: Utsalady-Uselessbay complex, 2 to 12 percent slopes	Utsalady	55	No	Ridges	---	---
	Uselessbay	35	No	Ridges	---	---
	Spieden	10	Yes	Drainageways	2B3	Yes
2026: Uselessbay-Utsalady complex, 0 to 10 percent slopes	Uselessbay	60	No	Ridges	---	---
	Utsalady	30	No	Ridges	---	---
	Spieden	10	Yes	Drainageways	2B3	Yes
2027: Utsalady-Uselessbay complex, 0 to 5 percent slopes	Utsalady	70	No	Ridges	---	---
	Uselessbay	20	No	Ridges	---	---
	Spieden	10	Yes	Drainageways	2B3	Yes
2052: Townsend-San Juan complex, 3 to 15 percent slopes	Townsend	70	No	Hillslopes	---	---
	San Juan	30	No	Hillslopes	---	---
2054: Zylstra-Mitchellbay complex, 0 to 5 percent slopes	Zylstra	80	No	Hillslopes	---	---
	Mitchellbay, cool	20	No	Valleys, hillslopes	---	---
2055: Zylstra-Mitchellbay complex, 2 to 10 percent slopes	Zylstra	80	No	Hillslopes	---	---
	Mitchellbay, cool	20	No	Valleys, hillslopes	---	---
3001: Hoypus sandy loam, 3 to 25 percent slopes	Hoypus	100	No	Hillslopes	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so	
					Hydric criteria code	Meet satura crite
3003: Keystone-Utsalady complex, 0 to 3 percent slopes	Keystone	60	No	Hillslopes	---	---
	Utsalady	30	No	Ridges	---	---
	Sucia, cool	10	No	Valleys	---	---
3005: San Juan sandy loam, 2 to 8 percent slopes	San Juan	100	No	Hillslopes	---	---
3007: San Juan sandy loam, 5 to 20 percent slopes	San Juan	100	No	Hillslopes	---	---
3008: Xerorthents-Endoaquents, tidal association, 0 to 100 percent slopes	Xerorthents	70	No	Hillslopes, sea cliffs, beaches	---	---
	Endoaquents, tidal	20	Yes	Beaches	2B1	Yes
	Beaches	10	Unrated	Beaches	---	---
3011: Everett-Alderwood complex, 0 to 5 percent slopes	Everett	70	No	Hillslopes	---	---
	Alderwood	30	No	Hillslopes	---	---
3017: Everett-Alderwood complex, 3 to 15 percent slopes	Everett	70	No	Hillslopes	---	---
	Alderwood	30	No	Hillslopes	---	---
3018: Everett sandy loam, cool, 15 to 40 percent slopes	Everett	100	No	Hillslopes	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so[...]	
					Hydric criteria code	Meet[s] satura[tion] crite[ria]
3019:						
Everett-Alderwood complex, 15 to 40 percent slopes	Everett	45	No	Hillslopes	---	---
	Alderwood	45	No	Hillslopes	---	---
	Morancreek, cool	10	No	Hillslopes	---	---
3020:						
Indianola loamy sand, 8 to 25 percent slopes	Indianola	100	No	Hillslopes	---	---
3021:						
Indianola loamy sand, 0 to 5 percent slopes	Indianola	100	No	Hillslopes	---	---
3022:						
Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes	Aquic Dystroxerepts, coastal bluffs	45	No	Sea cliffs	---	---
	Oxyaquic Xerorthents	45	No	Hillslopes, sea cliffs	---	---
	Beaches	10	No	Beaches	---	---
3024:						
Indianola loamy sand, 3 to 15 percent slopes	Indianola	100	No	Hillslopes	---	---
3050:						
Hoypus sandy loam, 2 to 8 percent slopes	Hoypus	100	No	Hillslopes	---	---
3051:						
Snakelum sandy loam, 0 to 2 percent slopes	Snakelum	80	No	Hillslopes	---	---
	San Juan	20	No	Hillslopes	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so: Hydric criteria code	Meet satura crite
3052: Everett-Hoypus association, 8 to 40 perent slopes	Everett	55	No	Hillslopes	---	---
	Hoypus	35	No	Hillslopes	---	---
	Utsalady	10	No	Ridges	---	---
3053: Bozarth-Ebeys complex, 0 to 12 percent slopes	Bozarth	80	No	Hillslopes	---	---
	Ebeys	20	No	Hillslopes	---	---
3054: Hoypus sandy loam, 0 to 3 percent slopes	Hoypus	100	No	Hillslopes	---	---
5000: Cady-Rock outcrop complex, 5 to 30 percent slopes	Cady	45	No	Hillslopes, mountain slopes	---	---
	Rock outcrop	35	No	---	---	---
	Doebay	10	No	Mountain slopes, hillslopes	---	---
	Killebrew	10	No	Hillslopes, mountain slopes	---	---
5001: Rock outcrop-Haro complex, 25 to 75 percent slopes	Rock outcrop	50	No	---	---	---
	Haro	40	No	Hillslopes, mountain slopes	---	---
	Hiddenridge	10	No	Hillslopes, mountain slopes	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so	
					Hydric criteria code	Meet satura crite
5003: Doebay-Morancreek complex, 5 to 25 percent slopes	Doebay	50	No	Hillslopes, mountain slopes	---	---
	Morancreek	30	No	Mountain slopes, hillslopes	---	---
	Cady	10	No	Hillslopes, mountain slopes	---	---
	Rock outcrop	10	No	---	---	---
5006: Cady-Rock outcrop complex, 25 to 75 percent slopes	Cady	70	No	Hillslopes, mountain slopes	---	---
	Doebay	15	No	Hillslopes, mountain slopes	---	---
	Rock outcrop	15	No	---	---	---
5007: Haro-Hiddenridge-Rock outcrop complex, 5 to 30 percent slopes	Haro	50	No	Hillslopes, mountain slopes	---	---
	Hiddenridge	30	No	mountain slopes, hillslopes	---	---
	Rock outcrop	20	No	---	---	---

Table 9.--Hydric Soils--Continued

Map symbol and map unit name	Component	Pct. of map unit	Hydric rating	Landform	Hydric so Hydric criteria code	Meet satura crite
5015: Doebay, moist-Cady-Rock outcrop complex, 10 to 30 percent slopes	Doebay, moist	40	No	Hillslopes, mountain slopes	---	---
	Cady	35	No	Hillslopes, mountain slopes	---	---
	Rock outcrop	15	No	---	---	---
	Aquic Dystroxerepts, bedrock hills	10	No	Drainageways	---	---

Explanation of hydric criteria codes:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels g Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   - A. are somewhat poorly drained and have a water table at the surface (0 feet) durin growing season, or
   - B. are poorly drained or very poorly drained and have either:
     - 1.) a water table at the surface (0 feet) during the growing season if texture coarse sand, sand, or fine sand in all layers within a depth of 20 inches,
     - 2.) a water table at a depth of 0.5 foot or less during the growing season if is equal to or greater than 6 in/hr in all layers within a depth of 20 inc
     - 3.) a water table at a depth of 1 foot or less during the growing season if pe is less than 6 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing se
4. Soils that are frequently flooded for long or very long duration during the growing s

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the county, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Soil Properties

Table 10 gives the engineering classifications and the range of engineering properties for the layers of each soil in the county.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages

are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the county and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the county or from nearby areas and on field examination.

Table 10.--Engineering Properties

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass[ing] sieve number-- 4	10	40
	In				Pct	Pct			
994:									
Urban land.									
995:									
Water, miscellaneous.									
996:									
Dumps.									
997:									
Pits, gravel.									
998:									
Water, saline.									
999:									
Water, fresh.									
1005:									
Shalcar---------	0-3	Muck	PT	A-8	0	0	100	100	85-10
	3-11	Muck	PT	A-8	0	0	100	100	85-10
	11-22	Muck	PT	A-8	0	0	100	100	85-10
	22-27	Fine sandy loam, silt loam, sandy loam	SM, CL-ML, CL	A-2, A-4	0	0-10	95-100	90-100	55-95
	27-44	Silt loam, sand, loam	SM, CL-ML, CL	A-4, A-2	0	0-10	95-100	90-100	55-95
	44-60	Silt loam, sandy loam	CL, CL-ML, SC-SM, SM	A-2, A-4	0	0-10	95-100	90-100	55-10
Shalcar, drained	0-3	Muck	PT	A-8	0	0	100	100	85-10
	3-11	Muck	PT	A-8	0	0	100	100	85-10
	11-22	Muck	PT	A-8	0	0	100	100	85-10
	22-27	Fine sandy loam, silt loam, sandy loam	SM, CL-ML, CL	A-2, A-4	0	0-10	95-100	90-100	55-95
	27-44	Silt loam, sand, loam	SM, CL-ML, CL	A-4, A-2	0	0-10	95-100	90-100	55-95
	44-60	Silt loam, sandy loam	CL-ML, SC-SM, SM, CL	A-2, A-4	0	0-10	95-100	90-100	55-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				Pct	Pct			
1005:									
Semiahmoo-------	0-9	Muck	PT	A-8	0	0	100	100	85-10
	9-10	Silt loam	ML	A-4	0	0	100	100	90-10
	10-30	Muck	PT	A-8	0	0	100	100	85-10
	30-48	Muck	PT	A-8	0	0	100	100	85-10
	48-60	Muck	PT	A-8	0	0	100	100	85-10
	60-72	Mucky peat	PT	A-8	0	0	100	100	85-10
	72-84	Mucky peat	PT	A-8	0	0	100	100	85-10
1006:									
Semiahmoo-------	0-9	Muck	PT	A-8	0	0	100	100	85-10
	9-10	Silt loam	ML	A-4	0	0	100	100	90-10
	10-30	Muck	PT	A-8	0	0	100	100	85-10
	30-48	Muck	PT	A-8	0	0	100	100	85-10
	48-60	Muck	PT	A-8	0	0	100	100	85-10
	60-72	Mucky peat	PT	A-8	0	0	100	100	85-10
	72-84	Mucky peat	PT	A-8	0	0	100	100	85-10
Semiahmoo, drained--------	0-9	Muck	PT	A-8	0	0	100	100	85-10
	9-10	Silt loam	ML	A-4	0	0	100	100	90-10
	10-30	Muck	PT	A-8	0	0	100	100	85-10
	30-48	Muck	PT	A-8	0	0	100	100	85-10
	48-60	Muck	PT	A-8	0	0	100	100	85-10
	60-72	Mucky peat	PT	A-8	0	0	100	100	85-10
	72-84	Mucky peat	PT	A-8	0	0	100	100	85-10
Shalcar---------	0-3	Muck	PT	A-8	0	0	100	100	85-10
	3-11	Muck	PT	A-8	0	0	100	100	85-10
	11-22	Muck	PT	A-8	0	0	100	100	85-10
	22-27	Fine sandy loam, silt loam, sandy loam	SM, CL-ML, CL	A-2, A-4	0	0-10	95-100	90-100	55-95
	27-44	Silt loam, sand, loam	SM, CL-ML, CL	A-4, A-2	0	0-10	95-100	90-100	55-95
	44-60	Silt loam, sandy loam	CL, CL-ML, SC-SM, SM	A-2-4, A-4	0	0-10	95-100	90-100	55-10
1016:									
Orcas-----------	0-3	Peat	PT	A-8	0	0	100	100	85-10
	3-12	Peat	PT	A-8	0	0	100	100	85-10
	12-60	Peat	PT	A-8	0	0	100	100	85-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
1017:									
Zylstra---------	0-4	Loam	ML, OL, SM	A-4, A-5	0-10	0-25	79-100	74-100	60-95
	4-12	Gravelly fine sandy loam, gravelly sandy loam, loam	SM, ML, OL	A-4, A-5, A-2	0-10	0-25	68-100	63-100	50-95
	12-18	Gravelly fine sandy loam, gravelly loam, sandy loam	SC-SM, CL-ML, SM	A-1, A-4, A-2	0-5	0-15	72-100	67-100	40-95
	18-32	Sandy loam, gravelly loam, gravelly sandy loam	SC-SM, CL, SM, SC	A-4, A-2, A-1	0-5	0-15	72-97	67-92	40-85
	32-37	Fine sandy loam, gravelly sandy loam, gravelly loam	SC, SC-SM, SM, CL	A-4, A-2	0-10	0-15	64-97	59-92	50-85
	37-60	Gravelly loam, sandy loam, gravelly sandy loam	CL, SC-SM, SM	A-1, A-2, A-4	0-5	0-15	73-91	68-86	40-85
Frostad---------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	1-6	Loam	ML	A-4	0	0	45-100	40-100	40-75
	6-16	Sandy loam, gravelly coarse sandy loam	SC-SM	A-2, A-1	0-10	0-10	55-100	50-100	35-65
	16-21	Gravelly sandy loam, coarse sandy loam	SC-SM	A-1, A-2	0-10	0-15	65-100	60-100	35-65
	21-60	Sandy loam, loam	SC	A-2	0	0	85-100	80-100	45-90
Frostad, drained	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loam	ML	A-4	0	0	45-100	40-100	40-75
	6-16	Sandy loam, gravelly coarse sandy loam	SC-SM	A-2, A-1	0-10	0-10	55-100	50-100	35-65
	16-21	Gravelly sandy loam, coarse sandy loam	SC-SM	A-1, A-2	0-10	0-15	65-100	60-100	35-65
	21-60	Sandy loam, loam	SC	A-2	0	0	85-100	80-100	45-90

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
1018:									
Coupeville------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Mitchellbay, cool-----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Gravelly sandy loam	SM, GM	A-4, A-2, A-1, A-5	0	0	50-100	45-100	30-70
	6-15	Sandy loam, gravelly loam	ML, SM, GM	A-4, A-2, A-1	0	0	50-100	45-100	30-95
	15-20	Sandy loam, loam	SC-SM, SM, CL-ML	A-4, A-2, A-1	0	0	85-100	80-100	40-95
	20-26	Loam, silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-10
	26-38	Loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-10
	38-60	Loam, silt loam	CL, CL-ML	A-6, A-4	0	0	85-100	80-100	65-10
Coupeville, drained--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				*Pct*	*Pct*			
1019:									
Morancreek, cool	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	45-70
	1-3	Sandy loam	SM	A-2, A-4, A-5	0-10	0-10	85-100	80-100	45-70
	3-10	Sandy loam, silt loam, gravelly loam	ML, SC-SM, CL-ML, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	10-21	Sandy loam, silt loam, gravelly loam	CL, CL-ML, SC-SM, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	21-28	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-95	55-90	30-80
	28-60	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-100	55-100	30-90
Limepoint-------	0-6	Mucky silt loam	OH, OL	A-5	0	0	75-100	70-100	65-10
	6-14	Loam, gravelly silt loam	ML, GM	A-2, A-4, A-5	0	0	50-100	45-100	40-95
	14-31	Loamy coarse sand, gravelly loam, sand	SM, SP, SC, SC-SM	A-1, A-2, A-4	0	0	55-100	50-100	25-75
	31-49	Loam, gravelly sandy loam, sand	CL-ML, CL, GP	A-1, A-4, A-2	0	0	50-100	45-100	30-95
	49-58	Sandy loam, loam, gravelly sand	SM, GP-GM, SC	A-4, A-2, A-1	0	0	50-100	45-100	45-70
	58-60	Silty clay loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	70-10
Shalcar---------	0-3	Muck	PT	A-8	0	0	100	100	85-10
	3-11	Muck	PT	A-8	0	0	100	100	85-10
	11-22	Muck	PT	A-8	0	0	100	100	85-10
	22-27	Fine sandy loam, silt loam, sandy loam	SM, CL-ML, CL	A-2, A-4	0	0-10	95-100	90-100	55-95
	27-44	Silt loam, sand, loam	SM, CL-ML, CL	A-4, A-2	0	0-10	95-100	90-100	55-95
	44-60	Silt loam, sandy loam	CL, CL-ML, SC-SM, SM	A-2, A-4	0	0-10	95-100	90-100	55-10
1020:									
Sholander, cool	0-8	Gravelly loam	GM, ML, OL	A-2, A-4, A-5	0-5	0-10	60-100	55-100	40-95
	8-16	Gravelly sandy loam, gravelly loamy sand	SM, SC-SM	A-1, A-2	0-5	0-5	60-100	55-100	25-75
	16-28	Gravelly loamy sand, sand	SP-SM, SM	A-2, A-1	0-5	0-5	55-100	50-100	25-75
	28-51	Gravelly sand, loamy sand	SP-SM, SM	A-2, A-1	0-5	0-5	60-100	55-100	30-75
	51-60	Gravelly sandy loam, loam	CL, CL-ML, SC-SM	A-2, A-4	0-5	0	85-100	80-100	45-95

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				Pct	Pct			
1020:									
Limepoint-------	0-6	Mucky silt loam	OL, OH	A-5	0	0	75-100	70-100	65-10
	6-14	Loam, gravelly silt loam	ML, GM	A-2, A-4, A-5	0	0	50-100	45-100	40-95
	14-31	Loamy coarse sand, gravelly loam, sand	SP, SC, SC-SM, SM	A-1, A-2, A-4	0	0	55-100	50-100	25-75
	31-49	Loam, gravelly sandy loam, sand	CL-ML, CL, GP	A-1, A-4, A-2	0	0	50-100	45-100	30-95
	49-58	Sandy loam, loam, gravelly sand	SM, GP-GM, SC	A-2, A-1, A-4	0	0	50-100	45-100	45-70
	58-60	Silty clay loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	70-10
Shalcar---------	0-3	Muck	PT	A-8	0	0	100	100	85-10
	3-11	Muck	PT	A-8	0	0	100	100	85-10
	11-22	Muck	PT	A-8	0	0	100	100	85-10
	22-27	Fine sandy loam, silt loam, sandy loam	SM, CL-ML, CL	A-2, A-4	0	0-10	95-100	90-100	55-95
	27-44	Silt loam, sand, loam	SM, CL-ML, CL	A-4, A-2	0	0-10	95-100	90-100	55-95
	44-60	Silt loam, sandy loam	CL, CL-ML, SC-SM, SM	A-2, A-4	0	0-10	95-100	90-100	55-10
1021:									
Sholander, cool	0-8	Gravelly loam	GM, ML, OL	A-2, A-4, A-5	0-5	0-10	60-100	55-100	40-95
	8-16	Gravelly sandy loam, gravelly loamy sand	SM, SC-SM	A-1, A-2	0-5	0-5	60-100	55-100	25-75
	16-28	Gravelly loamy sand, sand	SP-SM, SM	A-2, A-1	0-5	0-5	55-100	50-100	25-75
	28-51	Gravelly sand, loamy sand	SP-SM, SM	A-2, A-1	0-5	0-5	60-100	55-100	30-75
	51-60	Gravelly sandy loam, loam	CL, CL-ML, SC-SM	A-2, A-4	0-5	0	85-100	80-100	45-95
Spieden---------	0-4	Mucky silt loam	OH, OL	A-4, A-5	0	0-10	70-100	65-100	65-10
	4-11	Loam, silt loam	ML, OH	A-4, A-5	0	0-10	70-100	65-100	60-10
	11-24	Sand, gravelly loamy sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	24-36	Sand, gravelly loamy coarse sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	36-48	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
	48-60	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40
	In				*Pct*	*Pct*			
1021:									
Spieden, drained	0-4	Mucky silt loam	OH, OL	A-4, A-5	0	0-10	70-100	65-100	65-10
	4-11	Loam, silt loam	ML, OH	A-4, A-5	0	0-10	70-100	65-100	60-10
	11-24	Sand, gravelly loamy sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	24-36	Sand, gravelly loamy coarse sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	36-48	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
	48-60	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
Sucia, cool-----	0-8	Loamy sand	SM	A-1, A-2	0	0	85-100	80-100	40-75
	8-17	Gravelly sand, loamy sand	SM, SP-SM	A-1, A-2	0	0-15	60-100	55-100	30-75
	17-31	Sand, gravelly loamy sand	SM, SP-SM	A-1, A-2	0	0-15	80-100	75-100	35-75
	31-38	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7	0	0	100	100	80-10
	38-60	Loam, sandy loam, silt loam	CL, SC	A-2, A-6, A-7	0	0	85-100	80-100	45-10
1022:									
Coveland, cool--	0-4	Loam	ML, SM, OH	A-4, A-5	0	0	75-100	70-100	60-95
	4-9	Loam, sandy loam, silt loam	ML, SC-SM	A-1, A-4, A-7	0	0	75-100	70-100	40-10
	9-20	Sandy loam, loam, loamy sand	CL, SC-SM, SM	A-1, A-2, A-6	0	0	85-100	80-100	40-95
	20-36	Silty clay loam, silt loam, loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	36-44	Silty clay loam, loam, silt loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	44-60	Silty clay loam, loam, silt loam	ML	A-7, A-4, A-6	0	0	85-100	80-100	65-10
Coveland, cool, drained--------	0-4	Loam	ML, SM, OH	A-4, A-5	0	0	75-100	70-100	60-95
	4-9	Loam, sandy loam, silt loam	ML, SC-SM	A-1, A-4, A-7	0	0	75-100	70-100	40-10
	9-20	Sandy loam, loam, loamy sand	CL, SC-SM, SM	A-1, A-2, A-6	0	0	85-100	80-100	40-95
	20-36	Silty clay loam, silt loam, loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	36-44	Silty clay loam, loam, silt loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	44-60	Silty clay loam, loam, silt loam	ML	A-7, A-4, A-6	0	0	85-100	80-100	65-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				Pct	Pct			
1022:									
Coupeville------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Sucia, cool-----	0-8	Loamy sand	SM	A-1, A-2	0	0	85-100	80-100	40-75
	8-17	Gravelly sand, loamy sand	SM, SP-SM	A-1, A-2	0	0-15	60-100	55-100	30-75
	17-31	Sand, gravelly loamy sand	SM, SP-SM	A-1, A-2	0	0-15	80-100	75-100	35-75
	31-38	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7	0	0	100	100	80-10
	38-60	Loam, sandy loam, silt loam	CL, SC	A-2, A-6, A-7	0	0	85-100	80-100	45-10
1023:									
Coupeville------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
1023:									
Coupeville, drained--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Coveland, cool--	0-4	Loam	ML, SM, OH	A-4, A-5	0	0	75-100	70-100	60-95
	4-9	Loam, sandy loam, silt loam	ML, SC-SM	A-1, A-4, A-7	0	0	75-100	70-100	40-10
	9-20	Sandy loam, loam, loamy sand	CL, SC-SM, SM	A-1, A-2, A-6	0	0	85-100	80-100	40-95
	20-36	Silty clay loam, silt loam, loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	36-44	Silty clay loam, loam, silt loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	44-60	Silty clay loam, loam, silt loam	ML	A-7, A-4, A-6	0	0	85-100	80-100	65-10
1024:									
Limepoint-------	0-6	Mucky silt loam	OH, OL	A-5	0	0	75-100	70-100	65-10
	6-14	Loam, gravelly silt loam	ML, GM	A-2, A-4, A-5	0	0	50-100	45-100	40-95
	14-31	Loamy coarse sand, gravelly loam, sand	SM, SP, SC, SC-SM	A-1, A-2, A-4	0	0	55-100	50-100	25-75
	31-49	Loam, gravelly sandy loam, sand	CL-ML, CL, GP	A-1, A-4, A-2	0	0	50-100	45-100	30-95
	49-58	Sandy loam, loam, gravelly sand	SM, GP-GM, SC	A-2, A-1, A-4	0	0	50-100	45-100	45-70
	58-60	Silty clay loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	70-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				Pct	Pct			
1024:									
Sholander, cool	0-8	Gravelly loam	GM, ML, OL	A-2, A-4, A-5	0-5	0-10	60-100	55-100	40-95
	8-16	Gravelly sandy loam, gravelly loamy sand	SM, SC-SM	A-1, A-2	0-5	0-5	60-100	55-100	25-75
	16-28	Gravelly loamy sand, sand	SP-SM, SM	A-2, A-1	0-5	0-5	55-100	50-100	25-75
	28-51	Gravelly sand, loamy sand	SP-SM, SM	A-2, A-1	0-5	0-5	60-100	55-100	30-75
	51-60	Gravelly sandy loam, loam	CL, CL-ML, SC-SM	A-2, A-4	0-5	0	85-100	80-100	45-95
Limepoint, drained--------	0-6	Mucky silt loam	OH, OL	A-5	0	0	75-100	70-100	65-10
	6-14	Loam, gravelly silt loam	ML, GM	A-2, A-4, A-5	0	0	50-100	45-100	40-95
	14-31	Loamy coarse sand, gravelly loam, sand	SM, SP, SC, SC-SM	A-1, A-2, A-4	0	0	55-100	50-100	25-75
	31-49	Loam, gravelly sandy loam, sand	CL-ML, CL, GP	A-1, A-4, A-2	0	0	50-100	45-100	30-95
	49-58	Sandy loam, loam, gravelly sand	SM, GP-GM, SC	A-2, A-1, A-4	0	0	50-100	45-100	45-70
	58-60	Silty clay loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	70-10
Shalcar---------	0-3	Muck	PT	A-8	0	0	100	100	85-10
	3-11	Muck	PT	A-8	0	0	100	100	85-10
	11-22	Muck	PT	A-8	0	0	100	100	85-10
	22-27	Fine sandy loam, silt loam, sandy loam	SM, CL-ML, CL	A-2, A-4	0	0-10	95-100	90-100	55-95
	27-44	Silt loam, sand, loam	SM, CL-ML, CL	A-4, A-2	0	0-10	95-100	90-100	55-95
	44-60	Silt loam, sandy loam	CL, CL-ML, SC-SM, SM	A-2, A-4	0	0-10	95-100	90-100	55-10
1025:									
Beaches---------	0-60	Stratified sand to gravel			---	---	---	---	---
Endoaquents, tidal----------	0-29	Gravelly sand	SM, SP-SM	A-2, A-1	0	0-10	80-95	75-90	40-70
	29-48	Extremely gravelly coarse sand, very gravelly coarse sand	GP, GP-GM, SP-SM	A-1	0	0-10	20-65	15-60	5-45
	48-60	Very gravelly coarse sand, extremely gravelly coarse sand	GW, GW-GM	A-1	0	0-10	10-55	5-50	0-45

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40
	In				Pct	Pct			
1025:									
Xerorthents-----	0-1	Very gravelly sand	SP-SM, GP-GM, GW	A-1	0	0-25	30-55	25-50	15-45
	1-20	Very gravelly sand, extremely gravelly coarse sand	SP-SM, GP, GP-GM	A-1	0	0-20	20-55	15-50	5-45
	20-60	Extremely gravelly coarse sand, very gravelly sand	GW, GP-GM	A-1	0	0-20	20-55	15-50	5-45
1026:									
Coveland, prairie--------	0-4	Loam	ML, SM, OH	A-4, A-5	0	0	75-100	70-100	60-95
	4-9	Loam, sandy loam, silt loam	ML, SC-SM	A-1, A-4, A-7	0	0	75-100	70-100	40-10
	9-20	Sandy loam, loam, loamy sand	CL, SC-SM, SM	A-1, A-2, A-6	0	0	85-100	80-100	40-95
	20-36	Silty clay loam, silt loam, loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	36-44	Silty clay loam, loam, silt loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	44-60	Silty clay loam, loam, silt loam	ML	A-7, A-4, A-6	0	0	85-100	80-100	65-10
Coveland, prairie, drained--------	0-4	Loam	ML, SM, OH	A-4, A-5	0	0	75-100	70-100	60-95
	4-9	Loam, sandy loam, silt loam	ML, SC-SM	A-1, A-4, A-7	0	0	75-100	70-100	40-10
	9-20	Sandy loam, loam, loamy sand	CL, SC-SM, SM	A-1, A-2, A-6	0	0	85-100	80-100	40-95
	20-36	Silty clay loam, silt loam, loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	36-44	Silty clay loam, loam, silt loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	44-60	Silty clay loam, loam, silt loam	ML	A-7, A-4, A-6	0	0	85-100	80-100	65-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				*Pct*	*Pct*			
1026: Coupeville, prairie--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Sucia, prairie--	0-8	Loamy sand	SM	A-1, A-2	0	0	85-100	80-100	40-75
	8-17	Gravelly sand, loamy sand	SM, SP-SM	A-1, A-2	0	0-15	60-100	55-100	30-75
	17-31	Sand, gravelly loamy sand	SM, SP-SM	A-1, A-2	0	0-15	80-100	75-100	35-75
	31-38	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7	0	0	100	100	80-10
	38-60	Loam, sandy loam, silt loam	CL, SC	A-2, A-6, A-7	0	0	85-100	80-100	45-10
1027: Coupeville, prairie--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				*Pct*	*Pct*			
1027:									
Coupeville, prairie, drained--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Coveland, prairie--------	0-4	Loam	ML, SM, OH	A-4, A-5	0	0	75-100	70-100	60-95
	4-9	Loam, sandy loam, silt loam	ML, SC-SM	A-1, A-4, A-7	0	0	75-100	70-100	40-10
	9-20	Sandy loam, loam, loamy sand	CL, SC-SM, SM	A-1, A-2, A-6	0	0	85-100	80-100	40-95
	20-36	Silty clay loam, silt loam, loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	36-44	Silty clay loam, loam, silt loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	44-60	Silty clay loam, loam, silt loam	ML	A-7, A-4, A-6	0	0	85-100	80-100	65-10
1028:									
Orcas, drained--	0-3	Peat	PT	A-8	0	0	100	100	85-10
	3-12	Peat	PT	A-8	0	0	100	100	85-10
	12-60	Peat	PT	A-8	0	0	100	100	85-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
1051:									
Coupeville, prairie--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Ebeys-----------	0-6	Loam	CL-ML, OL	A-4	0	0	100	100	85-95
	6-15	Loam	SM, CL-ML, OL	A-4, A-2	0	0	100	100	60-95
	15-23	Sandy loam	SM, SC-SM	A-2, A-4	0	0	100	100	50-75
	23-34	Loamy sand	SM	A-2	0	0	100	100	50-80
	34-50	Loamy sand	SM	A-2	0	0	100	100	50-80
	50-60	Fine sand	SM	A-2	0	0	100	100	50-80
Coupeville, prairie, drained--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
1052:									
Ebeys-----------	0-6	Loam	ML, CL-ML	A-4	0	0	100	100	85-95
	6-15	Loam	SM, CL-ML	A-4, A-2	0	0	100	100	60-95
	15-23	Sandy loam	SM, SC-SM	A-2, A-4	0	0	100	100	50-75
	23-34	Loamy sand	SM	A-2	0	0	100	100	50-80
	34-50	Loamy sand	SM	A-2	0	0	100	100	50-80
	50-60	Fine sand	SM	A-2	0	0	100	100	50-80

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
1052:									
Coupeville, prairie--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Coupeville, prairie, drained--------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
1053:									
Dugualla--------	0-11	Muck	PT	A-8	0	0	100	100	100
	11-20	Muck	PT	A-8	0	0	100	100	100
	20-26	Muck	PT	A-8	0	0	90-100	65-100	65-10
	26-60	Muck	PT	A-8	0	0	100	100	100
Dugualla, protected------	0-11	Muck	PT	A-8	0	0	100	100	100
	11-20	Muck	PT	A-8	0	0	100	100	100
	20-26	Muck	PT	A-8	0	0	90-100	65-100	65-10
	26-60	Muck	PT	A-8	0	0	100	100	100

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				*Pct*	*Pct*			
1053:									
Endoaquents, tidal----------	0-29	Gravelly sand	SM, SP-SM	A-1-b, A-2	0	0-10	80-95	75-90	40-70
	29-48	Extremely gravelly coarse sand, very gravelly coarse sand	GP, GP-GM, SP-SM	A-1-a	0	0-10	20-65	15-60	5-45
	48-60	Very gravelly coarse sand, extremely gravelly coarse sand	GW, GW-GM	A-1-a	0	0-10	10-55	5-50	0-45
1054:									
Puget, drained--	0-7	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-10
	7-17	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-10
	17-25	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-10
	25-31	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-10
	31-40	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-10
	40-45	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-10
	45-60	Silty clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-10
Endoaquents, tidal----------	0-29	Gravelly sand	SM, SP-SM	A-1-b, A-2	0	0-10	80-95	75-90	40-70
	29-48	Extremely gravelly coarse sand, very gravelly coarse sand	GP, GP-GM, SP-SM	A-1-a	0	0-10	20-65	15-60	5-45
	48-60	Very gravelly coarse sand, extremely gravelly coarse sand	GW, GW-GM	A-1-a	0	0-10	10-55	5-50	0-45
Xerorthents-----	0-1	Very gravelly sand	SP-SM, GP-GM, GW	A-1	0	0-25	30-55	25-50	15-45
	1-20	Very gravelly sand, extremely gravelly coarse sand	SP-SM, GP, GP-GM	A-1	0	0-20	20-55	15-50	5-45
	20-60	Extremely gravelly coarse sand, very gravelly sand	GW, GP-GM	A-1	0	0-20	20-55	15-50	5-45

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passi sieve number--		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
1055:									
Urban land.									
Coupeville------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10
Coveland--------	0-4	Loam	ML, SM, OH	A-4, A-5	0	0	75-100	70-100	60-95
	4-9	Loam, sandy loam, silt loam	ML, SC-SM	A-1, A-4, A-7	0	0	75-100	70-100	40-10
	9-20	Sandy loam, loam, loamy sand	CL, SC-SM, SM	A-1, A-2, A-6	0	0	85-100	80-100	40-95
	20-36	Silty clay loam, silt loam, loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	36-44	Silty clay loam, loam, silt loam	CL	A-7, A-4, A-6	0	0	85-100	80-100	65-10
	44-60	Silty clay loam, loam, silt loam	ML	A-7, A-4, A-6	0	0	85-100	80-100	65-10
Hoypus----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-5	Sandy loam	SC-SM, SM	A-1, A-2	0	0-10	80-95	75-90	40-65
	5-20	Loamy sand, very gravelly loamy sand, very gravelly sandy loam	SM, SW-SM	A-2, A-1	0-10	0-15	35-95	30-90	20-70
	20-36	Very gravelly loamy sand, very gravelly sand	GP-GM, GW	A-1	0-10	0-15	20-55	15-50	5-45
	36-60	Extremely gravelly sand, very gravelly loamy sand	GW, GP-GM	A-1	0-10	0-15	20-55	15-50	10-45

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
1055:									
Whidbey---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-6	Gravelly loam	GM, OL	A-2, A-4, A-5	0-10	0-40	35-95	30-90	25-85
	6-20	Very gravelly loam, very gravelly coarse sandy loam, very gravelly sandy loam	GC-GM, GM, GP-GM	A-4, A-2, A-1	0-10	0-25	25-60	20-55	10-50
	20-37	Very gravelly loamy sand, very gravelly sandy loam	GC, GM, GC-GM, GP-GM	A-2, A-1	0-5	0-25	35-65	30-60	15-45
	37-60	Very gravelly coarse sandy loam, very gravelly sandy clay loam, gravelly sandy loam	SC, SC-SM, SM	A-1, A-2, A-4, A-6	0-5	0-15	60-90	55-85	35-80
2000:									
Whidbey---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-6	Gravelly loam	GM, OL	A-2, A-4, A-5	0-10	0-40	50-75	50-75	45-65
	6-20	Very gravelly loam, very gravelly coarse sandy loam, very gravelly sandy loam	GC-GM, GM, GP-GM	A-4, A-2, A-1	0-10	0-25	25-60	20-55	10-50
	20-37	Very gravelly loamy sand, very gravelly sandy loam	GC, GM, GC-GM, GP-GM	A-2, A-1	0-5	0-25	35-50	30-50	15-45
	37-60	Very gravelly coarse sandy loam, very gravelly sandy clay loam, gravelly sandy loam	SC, SC-SM, SM	A-1, A-2, A-4, A-6	0-5	0-15	40-85	40-75	35-65

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
2000:									
Hoypus----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-5	Sandy loam	SC-SM, SM	A-1, A-2	0	0-10	80-95	75-90	40-65
	5-20	Loamy sand, very gravelly loamy sand, very gravelly sandy loam	SM, SW-SM	A-2, A-1	0-10	0-15	50-95	45-90	20-70
	20-36	Very gravelly loamy sand, very gravelly sand	GP-GM, GW	A-1	0-10	0-15	20-55	15-50	5-45
	36-60	Extremely gravelly sand, very gravelly loamy sand	GW, GP-GM	A-1	0-10	0-15	20-55	15-50	10-45
2010:									
Whidbey---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-6	Gravelly loam	GM, OL	A-2, A-4, A-5	0-10	0-40	50-75	50-75	45-65
	6-20	Very gravelly loam, very gravelly coarse sandy loam, very gravelly sandy loam	GC-GM, GM, GP-GM	A-4, A-2, A-1	0-10	0-25	25-60	20-55	10-50
	20-37	Very gravelly loamy sand, very gravelly sandy loam	GC, GM, GC-GM, GP-GM	A-2, A-1	0-5	0-25	35-50	30-50	15-45
	37-60	Very gravelly coarse sandy loam, very gravelly sandy clay loam, gravelly sandy loam	SC, SC-SM, SM	A-1, A-2, A-4, A-6	0-5	0-15	40-85	40-75	35-65
Hoypus----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-5	Sandy loam	SC-SM, SM	A-1, A-2	0	0-10	80-95	75-90	40-65
	5-20	Loamy sand, very gravelly loamy sand, very gravelly sandy loam	SM, SW-SM	A-2, A-1	0-10	0-15	35-95	30-90	20-70
	20-36	Very gravelly loamy sand, very gravelly sand	GP-GM, GW	A-1	0-10	0-15	20-55	15-50	5-45
	36-60	Extremely gravelly sand, very gravelly loamy sand	GW, GP-GM	A-1	0-10	0-15	20-55	15-50	10-45

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
2012:									
Elwha-----------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-6	Gravelly sandy loam	SC-SM	A-1, A-2	0	0	48-74	47-73	35-64
	6-14	Gravelly sandy loam	GC-GM, SC-SM	A-2, A-1	0-10	0-10	48-74	47-73	35-64
	14-26	Gravelly sandy loam, coarse sandy loam	SC-SM, GC	A-1, A-2	0-10	0-10	48-74	47-73	35-64
	26-35	Gravelly sandy loam, gravelly coarse sandy loam	GC, SC-SM	A-1, A-2	0	0-7	56-79	54-78	39-67
	35-44	Gravelly sandy loam, sandy loam	GC, SC	A-1, A-2	0	0	57-80	56-79	38-64
	44-60	Gravelly sandy loam, sandy loam	GC, SC	A-1, A-2	0	0	57-80	56-79	38-64
Zylstra---------	0-4	Loam	ML, OL, SM	A-4, A-5	0-10	0-25	79-100	74-100	60-95
	4-12	Gravelly fine sandy loam, gravelly sandy loam, loam	SM, ML, OL	A-4, A-5, A-2	0-10	0-25	68-100	63-100	50-95
	12-18	Gravelly fine sandy loam, gravelly loam, sandy loam	SC-SM, CL-ML, SM	A-1, A-4, A-2	0-5	0-15	72-100	67-100	40-95
	18-32	Sandy loam, gravelly loam, gravelly sandy loam	SC-SM, CL, SM, SC	A-4, A-2, A-1	0-5	0-15	72-97	67-92	40-85
	32-37	Fine sandy loam, gravelly sandy loam, gravelly loam	SC, SC-SM, SM, CL	A-4, A-2	0-10	0-15	64-97	59-92	50-85
	37-60	Gravelly loam, sandy loam, gravelly sandy loam	CL, SC-SM, SM	A-1, A-2, A-4	0-5	0-15	73-91	68-86	40-85
Morancreek, cool	0-1	Slightly decomposed plant material	PT	A-8	0	0	85-100	80-100	45-70
	1-3	Sandy loam	SM	A-2, A-4, A-5	0-10	0-10	85-100	80-100	45-70
	3-10	Sandy loam, silt loam, gravelly loam	ML, SC-SM, CL-ML, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	10-21	Sandy loam, silt loam, gravelly loam	CL, CL-ML, SC-SM, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	21-28	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-95	55-90	30-80
	28-60	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-100	55-100	30-90

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				Pct	Pct			
2012:									
Everett	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	2-9	Sandy loam	SM	A-1, A-2	0	0	80-95	75-90	40-65
	9-13	Gravelly sandy loam, loamy sand, very gravelly coarse sandy loam	SC-SM, SM, GP-GM	A-1, A-2	0-10	0-10	50-95	45-90	20-70
	13-30	Extremely gravelly loamy coarse sand, very gravelly coarse sand	GW-GM, SM, GP	A-1, A-2	0-10	0-10	25-85	20-80	10-60
	30-60	Fine sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GW-GM	A-1	0-10	0-10	20-40	15-35	10-30
2013:									
Zylstra	0-4	Loam	ML, OL, SM	A-4, A-5	0-10	0-25	79-100	74-100	60-95
	4-12	Gravelly fine sandy loam, gravelly sandy loam, loam	SM, ML, OL	A-4, A-5, A-2	0-10	0-25	68-100	63-100	50-95
	12-18	Gravelly fine sandy loam, gravelly loam, sandy loam	SC-SM, CL-ML, SM	A-1, A-4, A-2	0-5	0-15	72-100	67-100	40-95
	18-32	Sandy loam, gravelly loam, gravelly sandy loam	SC-SM, CL, SM, SC	A-4, A-2, A-1	0-5	0-15	72-97	67-92	40-85
	32-37	Fine sandy loam, gravelly sandy loam, gravelly loam	SC, SC-SM, SM, CL	A-4, A-2	0-10	0-15	64-97	59-92	50-85
	37-60	Gravelly loam, sandy loam, gravelly sandy loam	CL, SC-SM, SM	A-1, A-2, A-4	0-5	0-15	73-91	68-86	40-85
Frostad	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loam	ML	A-4	0	0	45-100	40-100	40-75
	6-16	Sandy loam, gravelly coarse sandy loam	SC-SM	A-2-4, A-1	0-10	0-10	55-100	50-100	35-65
	16-21	Gravelly sandy loam, coarse sandy loam	SC-SM	A-1, A-2	0-10	0-15	65-100	60-100	35-65
	21-60	Sandy loam, loam	SC	A-2	0	0	85-100	80-100	45-90

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
2013:									
Elwha-----------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-6	Gravelly sandy loam	SC-SM	A-1, A-2	0	0	48-74	47-73	35-64
	6-14	Gravelly sandy loam	GC-GM, SC-SM	A-2, A-1	0-10	0-10	48-74	47-73	35-64
	14-26	Gravelly sandy loam, coarse sandy loam	SC-SM, GC	A-1, A-2	0-10	0-10	48-74	47-73	35-64
	26-35	Gravelly sandy loam, gravelly coarse sandy loam	GC, SC-SM	A-1, A-2	0	0-7	56-79	54-78	39-67
	35-44	Gravelly sandy loam, sandy loam	GC, SC	A-1, A-2	0	0	57-80	56-79	38-64
	44-60	Gravelly sandy loam, sandy loam	GC, SC	A-1, A-2-4	0	0	57-80	56-79	38-64
2016:									
Zylstra---------	0-4	Loam	ML, OL, SM	A-4, A-5	0-10	0-25	79-100	74-100	60-95
	4-12	Gravelly fine sandy loam, gravelly sandy loam, loam	SM, ML, OL	A-4, A-5, A-2	0-10	0-25	68-100	63-100	50-95
	12-18	Gravelly fine sandy loam, gravelly loam, sandy loam	SC-SM, CL-ML, SM	A-1, A-4, A-2	0-5	0-15	72-100	67-100	40-95
	18-32	Sandy loam, gravelly loam, gravelly sandy loam	SC-SM, CL, SM, SC	A-4, A-2, A-1	0-5	0-15	72-97	67-92	40-85
	32-37	Fine sandy loam, gravelly sandy loam, gravelly loam	SC, SC-SM, SM, CL	A-4, A-2	0-10	0-15	64-97	59-92	50-85
	37-60	Gravelly loam, sandy loam, gravelly sandy loam	CL, SC-SM, SM	A-1, A-2, A-4	0-5	0-15	73-91	68-86	40-85

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				Pct	Pct			
2016:									
Alderwood-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	1-10	Extremely gravelly sandy loam	GW-GM, GP-GM	A-1, A-2	0-10	0-10	15-25	15-25	10-20
	10-18	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GM, GW-GM	A-1, A-2	0-10	0-25	30-50	25-45	10-35
	18-36	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GC, GP-GM	A-1	0-5	0-30	20-50	15-45	5-35
	36-60	Very gravelly loam, silt loam, gravelly silty clay loam	GC, CL	A-4, A-6, A-7	0	0-5	25-90	25-90	20-85
Everett---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	2-9	Sandy loam	SM	A-1, A-2	0	0	80-95	75-90	40-65
	9-13	Gravelly sandy loam, loamy sand, very gravelly coarse sandy loam	GP-GM, SC-SM, SM	A-1, A-2	0-10	0-10	50-95	45-90	20-70
	13-30	Extremely gravelly loamy coarse sand, very gravelly coarse sand	GP, GW-GM, SM	A-1, A-2	0-10	0-10	25-85	20-80	10-60
	30-60	Fine sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GW-GM	A-1	0-10	0-10	20-40	15-35	10-30
Frostad---------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loam	ML	A-4	0	0	45-100	40-100	40-75
	6-16	Sandy loam, gravelly coarse sandy loam	SC-SM	A-2, A-1	0-10	0-10	55-100	50-100	35-65
	16-21	Gravelly sandy loam, coarse sandy loam	SC-SM	A-1, A-2	0-10	0-15	65-100	60-100	35-65
	21-60	Sandy loam, loam	SC	A-2	0	0	85-100	80-100	45-90

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40
	In				Pct	Pct			
2017:									
Bozarth---------	0-10	Sandy loam	SM	A-4, A-2, A-5	0-10	0-10	94-100	89-100	55-70
	10-16	Sandy loam, loam, fine sandy loam	SM, ML, SC-SM	A-2, A-4, A-5	0-10	0-10	94-100	89-100	55-95
	16-19	Sandy loam, gravelly fine sandy loam, fine sandy loam	SM, SC-SM, ML	A-2, A-4	0-10	0-10	94-100	89-100	55-85
	19-23	Sandy loam, gravelly fine sandy loam, fine sandy loam	SM, SC-SM, CL	A-2, A-4	0-5	0-5	81-100	76-100	45-85
	23-35	Fine sandy loam, gravelly sandy loam, sandy loam	SM, SC-SM, SC, CL	A-4, A-2	0-5	0-5	81-100	76-100	45-85
	35-60	Sandy loam, gravelly loam, silt loam	ML, CL-ML, SM	A-2, A-4	0-5	0-5	75-100	70-100	40-10
Pilepoint-------	0-4	Loam	ML, OL	A-4, A-5	0	0	75-100	70-100	60-95
	4-13	Loam, gravelly sandy loam	GM, ML	A-1, A-2, A-4, A-5	0	0	45-100	40-100	25-95
	13-22	Gravelly loamy sand, very gravelly sandy loam	SM, GM, GP-GM	A-2, A-1	0	0-10	32-77	20-70	10-50
	22-29	Gravelly loam, gravelly loamy sand, gravelly sandy loam	ML, GM, SM	A-2, A-4, A-1	0	0-10	51-100	45-100	25-85
	29-36	Loam, silty clay loam, silt loam	CL	A-6, A-4, A-7	0	0	75-100	70-100	65-10
	36-46	Silt loam, loam	CL	A-6, A-4, A-7	0	0	80-100	75-100	65-10
	46-60	Silt loam, loam	CL	A-4, A-6, A-7	0	0	80-100	75-100	65-10
2018:									
Sucia, cool-----	0-8	Loamy sand	SM	A-1, A-2	0	0	85-100	80-100	40-75
	8-17	Gravelly sand, loamy sand	SM, SP-SM	A-1, A-2	0	0-15	60-100	55-100	30-75
	17-31	Sand, gravelly loamy sand	SM, SP-SM	A-1, A-2	0	0-15	80-100	75-100	35-75
	31-38	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7	0	0	100	100	80-10
	38-60	Loam, sandy loam, silt loam	CL, SC	A-2, A-6, A-7	0	0	85-100	80-100	45-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
2018: Sholander, cool	0-8	Gravelly loam	GM, ML, OL	A-2, A-4, A-5	0-5	0-10	60-100	55-100	40-95
	8-16	Gravelly sandy loam, gravelly loamy sand	SM, SC-SM	A-1, A-2	0-5	0-5	60-100	55-100	25-75
	16-28	Gravelly loamy sand, sand	SP-SM, SM	A-2, A-1	0-5	0-5	55-100	50-100	25-75
	28-51	Gravelly sand, loamy sand	SP-SM, SM	A-2, A-1	0-5	0-5	60-100	55-100	30-75
	51-60	Gravelly sandy loam, loam	CL, CL-ML, SC-SM	A-2, A-4	0-5	0	85-100	80-100	45-95
2019: Mitchellbay, cool-----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Gravelly sandy loam	SM, GM	A-4, A-2, A-1, A-5	0	0	50-100	45-100	30-70
	6-15	Sandy loam, gravelly loam	ML, SM, GM	A-4, A-2, A-1	0	0	50-100	45-100	30-95
	15-20	Sandy loam, loam	SC-SM, SM, CL-ML	A-4, A-2, A-1	0	0	85-100	80-100	40-95
	20-26	Loam, silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-10
	26-38	Loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-10
	38-60	Loam, silt loam	CL, CL-ML	A-6, A-4	0	0	85-100	80-100	65-10
Coupeville------	0-7	Loam	ML, OH	A-4, A-5	0	0	95-100	90-100	75-95
	7-12	Loam, sandy loam, silt loam	SM, OH	A-5, A-2, A-4	0	0	95-100	90-100	55-10
	12-20	Clay loam, loam, sandy clay loam	SC, CL	A-2, A-4, A-6	0	0	90-100	85-100	65-10
	20-34	Clay loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	34-50	Silty clay loam, loam, clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	65-10
	50-60	Silt loam, loam, silty clay loam	CL	A-4, A-6, A-7	0	0	90-100	85-100	75-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				*Pct*	*Pct*			
2023:									
Sucia, cool-----	0-8	Loamy sand	SM	A-1, A-2	0	0	85-100	80-100	40-75
	8-17	Gravelly sand, loamy sand	SM, SP-SM	A-1, A-2	0	0-15	60-100	55-100	30-75
	17-31	Sand, gravelly loamy sand	SM, SP-SM	A-1, A-2	0	0-15	80-100	75-100	35-75
	31-38	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7	0	0	100	100	80-10
	38-60	Loam, sandy loam, silt loam	CL, SC	A-2, A-6, A-7	0	0	85-100	80-100	45-10
Sholander, cool	0-8	Gravelly loam	GM, ML, OL	A-2, A-4, A-5	0-5	0-10	60-100	55-100	40-95
	8-16	Gravelly sandy loam, gravelly loamy sand	SM, SC-SM	A-1, A-2	0-5	0-5	60-100	55-100	25-75
	16-28	Gravelly loamy sand, sand	SP-SM, SM	A-2, A-1	0-5	0-5	55-100	50-100	25-75
	28-51	Gravelly sand, loamy sand	SP-SM, SM	A-2, A-1	0-5	0-5	60-100	55-100	30-75
	51-60	Gravelly sandy loam, loam	CL, CL-ML, SC-SM	A-2, A-4	0-5	0	85-100	80-100	45-95
Spieden---------	0-4	Mucky silt loam	OH, OL	A-4, A-5	0	0-10	70-100	65-100	65-10
	4-11	Loam, silt loam	ML, OH	A-4, A-5	0	0-10	70-100	65-100	60-10
	11-24	Sand, gravelly loamy sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	24-36	Sand, gravelly loamy coarse sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	36-48	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
	48-60	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
2024:									
Indianola-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loamy sand	SM	A-1, A-2	0	0	95-100	90-100	45-75
	6-17	Loamy sand, loamy fine sand	SM	A-1, A-2, A-4	0	0	95-100	90-100	45-90
	17-27	Loamy fine sand, sand	SM, SP-SM, SC-SM	A-2, A-4, A-1	0	0	85-100	80-100	40-90
	27-37	Loamy sand, sand	SP-SM, SM, SC-SM	A-1, A-2	0	0	90-100	85-100	40-75
	37-60	Sand, loamy sand	SC-SM, SM, SP-SM	A-1, A-2	0	0	90-100	85-100	40-75

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
2024:									
Uselessbay------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-3	Gravelly sandy loam	GM	A-1, A-2	0	0-9	50-100	45-100	40-80
	3-8	Gravelly sandy loam, sandy loam	SC-SM	A-1, A-2	0	0-9	50-100	45-100	40-80
	8-15	Loamy sand, gravelly loamy sand	GC-GM	A-2, A-1	0	0-9	50-100	45-100	35-80
	15-29	Sand, gravelly sand	SP-SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	29-37	Gravelly sand, sand	SP-SM	A-1, A-2	0	0-8	50-90	50-90	40-75
	37-60	Gravelly sandy loam, sandy loam	SC-SM	A-2	0	0	60-80	55-80	40-60
Utsalady--------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-2	Loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	2-15	Gravelly loamy sand, loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	15-31	Loamy sand, gravelly loamy sand	SM, GP-GM	A-2, A-1	0	0-9	50-100	50-100	40-80
	31-42	Loamy sand, gravelly loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	42-50	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
	50-55	Gravelly sand, loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	55-60	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
2025:									
Utsalady--------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-2	Loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	2-15	Gravelly loamy sand, loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	15-31	Loamy sand, gravelly loamy sand	SM, GP-GM	A-2, A-1	0	0-9	50-100	50-100	40-80
	31-42	Loamy sand, gravelly loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	42-50	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
	50-55	Gravelly sand, loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	55-60	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
2025:									
Uselessbay------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-3	Gravelly sandy loam	GM	A-1, A-2	0	0-9	50-100	45-100	40-80
	3-8	Gravelly sandy loam, sandy loam	SC-SM	A-1, A-2	0	0-9	50-100	45-100	40-80
	8-15	Loamy sand, gravelly loamy sand	GC-GM	A-2, A-1	0	0-9	50-100	45-100	35-80
	15-29	Sand, gravelly sand	SP-SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	29-37	Gravelly sand, sand	SP-SM	A-1, A-2	0	0-8	50-90	50-90	40-75
	37-60	Gravelly sandy loam, sandy loam	SC-SM	A-2	0	0	60-80	55-80	40-60
Spieden---------	0-4	Mucky silt loam	OH, OL	A-4, A-5	0	0-10	70-100	65-100	65-10
	4-11	Loam, silt loam	ML, OH	A-4, A-5	0	0-10	70-100	65-100	60-10
	11-24	Sand, gravelly loamy sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	24-36	Sand, gravelly loamy coarse sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	36-48	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
	48-60	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
2026:									
Uselessbay------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-3	Gravelly sandy loam	GM	A-1, A-2	0	0-9	50-100	45-100	40-80
	3-8	Gravelly sandy loam, sandy loam	SC-SM	A-1, A-2	0	0-9	50-100	45-100	40-80
	8-15	Loamy sand, gravelly loamy sand	GC-GM	A-2, A-1	0	0-9	50-100	45-100	35-80
	15-29	Sand, gravelly sand	SP-SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	29-37	Gravelly sand, sand	SP-SM	A-1, A-2	0	0-8	50-90	50-90	40-75
	37-60	Gravelly sandy loam, sandy loam	SC-SM	A-2	0	0	60-80	55-80	40-60

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
2026:									
Utsalady--------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-2	Loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	2-15	Gravelly loamy sand, loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	15-31	Loamy sand, gravelly loamy sand	SM, GP-GM	A-2, A-1	0	0-9	50-100	50-100	40-80
	31-42	Loamy sand, gravelly loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	42-50	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
	50-55	Gravelly sand, loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	55-60	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
Spieden---------	0-4	Mucky silt loam	OH, OL	A-4, A-5	0	0-10	70-100	65-100	65-10
	4-11	Loam, silt loam	ML, OH	A-4, A-5	0	0-10	70-100	65-100	60-10
	11-24	Sand, gravelly loamy sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	24-36	Sand, gravelly loamy coarse sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	36-48	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
	48-60	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
2027:									
Utsalady--------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-2	Loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	2-15	Gravelly loamy sand, loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	15-31	Loamy sand, gravelly loamy sand	SM, GP-GM	A-2, A-1	0	0-9	50-100	50-100	40-80
	31-42	Loamy sand, gravelly loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	42-50	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
	50-55	Gravelly sand, loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	55-60	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				Pct	Pct			
2027:									
Uselessbay------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	2-3	Gravelly sandy loam	GM	A-1, A-2	0	0-9	50-100	45-100	40-80
	3-8	Gravelly sandy loam, sandy loam	SC-SM	A-1, A-2	0	0-9	50-100	45-100	40-80
	8-15	Loamy sand, gravelly loamy sand	GC-GM	A-2, A-1	0	0-9	50-100	45-100	35-80
	15-29	Sand, gravelly sand	SP-SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	29-37	Gravelly sand, sand	SP-SM	A-1, A-2	0	0-8	50-90	50-90	40-75
	37-60	Gravelly sandy loam, sandy loam	SC-SM	A-2	0	0	60-80	55-80	40-60
Spieden---------	0-4	Mucky silt loam	OH, OL	A-4, A-5	0	0-10	70-100	65-100	65-10
	4-11	Loam, silt loam	ML, OH	A-4, A-5	0	0-10	70-100	65-100	60-10
	11-24	Sand, gravelly loamy sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	24-36	Sand, gravelly loamy coarse sand	SP-SM, SM	A-2, A-1	0	0-10	60-100	55-100	30-75
	36-48	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
	48-60	Loamy sand, coarse sand	SM, SP-SM	A-2, A-1	0	0-10	80-100	75-100	40-70
2052:									
Townsend--------	0-5	Gravelly loam	GM	A-2, A-4	0	0-25	45-75	40-70	35-65
	5-18	Very gravelly loam, gravelly sandy loam	GW-GM, GM	A-1, A-2	0-10	0-25	20-45	15-40	15-40
	18-24	Very gravelly sandy loam, gravelly loam	GP-GM, GC-GM	A-2, A-1	0-10	0-30	20-50	15-45	10-40
	24-36	Very gravelly sandy loam, very gravelly loamy sand, very gravelly loam	GW-GM, GM	A-2, A-1	0-5	0-20	25-60	20-55	10-50
	36-60	Very gravelly sandy loam, gravelly loam	GC-GM, GW-GM, GP-GM	A-2, A-1	0-5	0-5	35-80	30-75	15-65

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40
	In				*Pct*	*Pct*			
2052:									
San Juan--------	0-4	Sandy loam	SM	A-2, A-4, A-1	0	0-10	75-100	70-100	40-70
	4-13	Gravelly loamy sand, loam, sandy loam	GP-GM, OL, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	13-19	Sandy loam, loam, gravelly loamy sand	ML, GP-GM, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	19-27	Gravelly loamy coarse sand, gravelly sandy loam, very gravelly loamy sand	GW-GM, SM	A-2, A-1	0	0-10	30-80	25-75	15-50
	27-41	Extremely gravelly loamy coarse sand, very gravelly loamy sand, extremely gravelly coarse sand	GP-GM, GM, GP	A-1	0	0-20	20-55	15-50	5-45
	41-62	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	15-55	10-50	5-45
	62-70	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	20-55	15-50	5-45
2054:									
Zylstra---------	0-4	Loam	ML, OL, SM	A-4, A-5	0-10	0-25	79-100	74-100	60-95
	4-12	Gravelly fine sandy loam, gravelly sandy loam, loam	SM, ML, OL	A-4, A-5, A-2	0-10	0-25	68-100	63-100	50-95
	12-18	Gravelly fine sandy loam, gravelly loam, sandy loam	SC-SM, CL-ML, SM	A-1, A-4, A-2	0-5	0-15	72-100	67-100	40-95
	18-32	Sandy loam, gravelly loam, gravelly sandy loam	SC-SM, CL, SM, SC	A-4, A-2, A-1	0-5	0-15	72-97	67-92	40-85
	32-37	Fine sandy loam, gravelly sandy loam, gravelly loam	SC, SC-SM, SM, CL	A-4, A-2	0-10	0-15	64-97	59-92	50-85
	37-60	Gravelly loam, sandy loam, gravelly sandy loam	CL, SC-SM, SM	A-1, A-2, A-4	0-5	0-15	73-91	68-86	40-85

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	Percentage pass sieve number-: 10	Percentage pass sieve number-: 40
	In				Pct	Pct			
2054:									
Mitchellbay,									
cool-----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-100
	1-6	Gravelly sandy loam	SM, GM	A-4, A-2, A-1, A-5	0	0	50-100	45-100	30-70
	6-15	Sandy loam, gravelly loam	ML, SM, GM	A-4, A-2, A-1	0	0	50-100	45-100	30-95
	15-20	Sandy loam, loam	SC-SM, SM, CL-ML	A-4, A-2, A-1	0	0	85-100	80-100	40-95
	20-26	Loam, silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-100
	26-38	Loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-100
	38-60	Loam, silt loam	CL, CL-ML	A-6, A-4	0	0	85-100	80-100	65-100
2055:									
Zylstra----------	0-4	Loam	ML, OL, SM	A-4, A-5	0-10	0-25	79-100	74-100	60-95
	4-12	Gravelly fine sandy loam, gravelly sandy loam, loam	SM, ML, OL	A-4, A-5, A-2	0-10	0-25	68-100	63-100	50-95
	12-18	Gravelly fine sandy loam, gravelly loam, sandy loam	SC-SM, CL-ML, SM	A-1, A-4, A-2	0-5	0-15	72-100	67-100	40-95
	18-32	Sandy loam, gravelly loam, gravelly sandy loam	SM, SC, SC-SM, CL	A-4, A-2, A-1	0-5	0-15	72-97	67-92	40-85
	32-37	Fine sandy loam, gravelly sandy loam, gravelly loam	SC, SC-SM, SM, CL	A-4, A-2	0-10	0-15	64-97	59-92	50-85
	37-60	Gravelly loam, sandy loam, gravelly sandy loam	CL, SC-SM, SM	A-1, A-2, A-4	0-5	0-15	73-91	68-86	40-85

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
2055:									
Mitchellbay, cool-----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Gravelly sandy loam	SM, GM	A-4, A-2, A-1, A-5	0	0	50-100	45-100	30-70
	6-15	Sandy loam, gravelly loam	ML, SM, GM	A-4, A-2, A-1	0	0	50-100	45-100	30-95
	15-20	Sandy loam, loam	SC-SM, SM, CL-ML	A-4, A-2, A-1	0	0	85-100	80-100	40-95
	20-26	Loam, silt loam, silty clay loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-10
	26-38	Loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	80-100	65-10
	38-60	Loam, silt loam	CL, CL-ML	A-6, A-4	0	0	85-100	80-100	65-10
3001:									
Hoypus----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-5	Sandy loam	SC-SM, SM	A-1, A-2	0	0-10	80-95	75-90	40-65
	5-20	Loamy sand, very gravelly loamy sand, very gravelly sandy loam	SM, SW-SM	A-2, A-1	0-10	0-15	35-95	30-90	20-70
	20-36	Very gravelly loamy sand, very gravelly sand	GP-GM, GW	A-1	0-10	0-15	20-55	15-50	5-45
	36-60	Extremely gravelly sand, very gravelly loamy sand	GW, GP-GM	A-1	0-10	0-15	20-55	15-50	10-45
3003:									
Keystone--------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	25-75
	1-3	Sandy loam	SM, SW-SM	A-2, A-1	0	0	60-100	45-100	25-75
	3-8	Gravelly loamy sand, sandy loam	SW-SM, SM	A-1, A-2	0	0	60-100	45-100	25-75
	8-19	Gravelly sand, loamy sand	SP, SC-SM, SM	A-1, A-2	0	0	60-100	50-100	25-70
	19-34	Gravelly sand, very gravelly loamy sand	SP, SP-SM, SM	A-2, A-1	0-15	0-15	60-100	50-100	25-70
	34-60	Coarse sand, loamy sand	SP, SP-SM, SM	A-2, A-1	0-15	0-15	55-100	50-100	25-70

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				Pct	Pct			
3003:									
Utsalady---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-2	Loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	2-15	Gravelly loamy sand, loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	15-31	Loamy sand, gravelly loamy sand	SM, GP-GM	A-2, A-1	0	0-9	50-100	50-100	40-80
	31-42	Loamy sand, gravelly loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	42-50	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
	50-55	Gravelly sand, loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	55-60	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
Sucia, cool------	0-8	Loamy sand	SM	A-1, A-2	0	0	85-100	80-100	40-75
	8-17	Gravelly sand, loamy sand	SM, SP-SM	A-1, A-2	0	0-15	60-100	55-100	30-75
	17-31	Sand, gravelly loamy sand	SM, SP-SM	A-1, A-2	0	0-15	80-100	75-100	35-75
	31-38	Loam, sandy clay loam, clay loam	CL, SC	A-6, A-7	0	0	100	100	80-10
	38-60	Loam, sandy loam, silt loam	CL, SC	A-2, A-6, A-7	0	0	85-100	80-100	45-10
3005:									
San Juan---------	0-4	Sandy loam	SM	A-2, A-4, A-1	0	0-10	75-100	70-100	40-70
	4-13	Gravelly loamy sand, loam, sandy loam	GP-GM, OL, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	13-19	Sandy loam, loam, gravelly loamy sand	ML, GP-GM, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	19-27	Gravelly loamy coarse sand, gravelly sandy loam, very gravelly loamy sand	GW-GM, SM	A-2, A-1	0	0-10	30-80	25-75	15-50
	27-41	Extremely gravelly loamy coarse sand, very gravelly loamy sand, extremely gravelly coarse sand	GP-GM, GM, GP	A-1	0	0-20	20-55	15-50	5-45
	41-62	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	15-55	10-50	5-45
	62-70	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	20-55	15-50	5-45

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				Pct	Pct			
3007:									
San Juan--------	0-4	Sandy loam	SM	A-2, A-4, A-1	0	0-10	75-100	70-100	40-70
	4-13	Gravelly loamy sand, loam, sandy loam	GP-GM, OL, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	13-19	Sandy loam, loam, gravelly loamy sand	ML, GP-GM, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	19-27	Gravelly loamy coarse sand, gravelly sandy loam, very gravelly loamy sand	GW-GM, SM	A-2, A-1	0	0-10	30-80	25-75	15-50
	27-41	Extremely gravelly loamy coarse sand, very gravelly loamy sand, extremely gravelly coarse sand	GP-GM, GM, GP	A-1	0	0-20	20-55	15-50	5-45
	41-62	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	15-55	10-50	5-45
	62-70	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	20-55	15-50	5-45
3008:									
Xerorthents-----	0-1	Very gravelly sand	SP-SM, GP-GM, GW	A-1	0	0-25	30-55	25-50	15-45
	1-20	Very gravelly sand, extremely gravelly coarse sand	SP-SM, GP, GP-GM	A-1	0	0-20	20-55	15-50	5-45
	20-60	Extremely gravelly coarse sand, very gravelly sand	GW, GP-GM	A-1	0	0-20	20-55	15-50	5-45
Endoaquents, tidal----------	0-29	Gravelly sand	SM, SP-SM	A-1, A-2	0	0-10	80-95	75-90	40-70
	29-48	Extremely gravelly coarse sand, very gravelly coarse sand	GP, GP-GM, SP-SM	A-1	0	0-10	20-65	15-60	5-45
	48-60	Very gravelly coarse sand, extremely gravelly coarse sand	GW, GW-GM	A-1	0	0-10	10-55	5-50	0-45
Beaches---------	0-60	Stratified sand to gravel			---	---	---	---	---

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40
	In				Pct	Pct			
3011:									
Everett---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	2-9	Sandy loam	SM	A-1, A-2	0	0	80-95	75-90	40-65
	9-13	Gravelly sandy loam, loamy sand, very gravelly coarse sandy loam	GP-GM, SC-SM, SM	A-1, A-2	0-10	0-10	50-95	45-90	20-70
	13-30	Extremely gravelly loamy coarse sand, very gravelly coarse sand	GP, GW-GM, SM	A-1, A-2	0-10	0-10	25-85	20-80	10-60
	30-60	Fine sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GW-GM	A-1	0-10	0-10	20-40	15-35	10-30
Alderwood-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	1-10	Extremely gravelly sandy loam	GW-GM, GP-GM	A-1, A-2	0-10	0-10	15-25	15-25	10-20
	10-18	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GM, GW-GM	A-1, A-2	0-10	0-25	30-50	25-45	10-35
	18-36	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GC, GP-GM	A-1	0-5	0-30	20-50	15-45	5-35
	36-60	Very gravelly loam, silt loam, gravelly silty clay loam	GC, CL	A-4, A-6, A-7	0	0-5	25-90	25-90	20-85

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	Percentage pass sieve number-: 10	Percentage pass sieve number-: 40
	In				Pct	Pct			
3017:									
Everett---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	2-9	Sandy loam	SM	A-1, A-2	0	0	80-95	75-90	40-65
	9-13	Gravelly sandy loam, loamy sand, very gravelly coarse sandy loam	GP-GM, SC-SM, SM	A-1, A-2	0-10	0-10	50-95	45-90	20-70
	13-30	Extremely gravelly loamy coarse sand, very gravelly coarse sand	GP, GW-GM, SM	A-1, A-2	0-10	0-10	25-85	20-80	10-60
	30-60	Fine sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GW-GM	A-1	0-10	0-10	20-40	15-35	10-30
Alderwood-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	1-10	Extremely gravelly sandy loam	GW-GM, GP-GM	A-1, A-2	0-10	0-10	15-25	15-25	10-20
	10-18	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GM, GW-GM	A-1, A-2	0-10	0-25	30-50	25-45	10-35
	18-36	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GC, GP-GM	A-1	0-5	0-30	20-50	15-45	5-35
	36-60	Very gravelly loam, silt loam, gravelly silty clay loam	GC, CL	A-4, A-6, A-7	0	0-5	25-90	25-90	20-85

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number--: 4	10	40
	In				*Pct*	*Pct*			
3018:									
Everett---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	2-9	Sandy loam	SM	A-1, A-2	0	0	80-95	75-90	40-65
	9-13	Gravelly sandy loam, loamy sand, very gravelly coarse sandy loam	GP-GM, SC-SM, SM	A-1, A-2	0-10	0-10	50-95	45-90	20-70
	13-30	Extremely gravelly loamy coarse sand, very gravelly coarse sand	GP, GW-GM, SM	A-1, A-2	0-10	0-10	25-85	20-80	10-60
	30-60	Fine sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GW-GM	A-1	0-10	0-10	20-40	15-35	10-30
3019:									
Everett---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	2-9	Sandy loam	SM	A-1, A-2	0	0	80-95	75-90	40-65
	9-13	Gravelly sandy loam, loamy sand, very gravelly coarse sandy loam	GP-GM, SC-SM, SM	A-1, A-2	0-10	0-10	50-95	45-90	20-70
	13-30	Extremely gravelly loamy coarse sand, very gravelly coarse sand	GP, GW-GM, SM	A-1, A-2	0-10	0-10	25-85	20-80	10-60
	30-60	Fine sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GW-GM	A-1	0-10	0-10	20-40	15-35	10-30

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number- 4	10	40
	In				Pct	Pct			
3019:									
Alderwood-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	1-10	Extremely gravelly sandy loam	GW-GM, GP-GM	A-1, A-2	0-10	0-10	15-25	15-25	10-20
	10-18	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GM, GW-GM	A-1, A-2	0-10	0-25	30-50	25-45	10-35
	18-36	Very gravelly sandy loam, extremely gravelly coarse sandy loam	GM, GP-GC, GP-GM	A-1	0-5	0-30	20-50	15-45	5-35
	36-60	Very gravelly loam, silt loam, gravelly silty clay loam	GC, CL	A-4, A-6, A-7	0	0-5	25-90	25-90	20-85
Morancreek, cool	0-1	Slightly decomposed plant material	PT	A-8	0	0	85-100	80-100	45-70
	1-3	Sandy loam	SM	A-2, A-4, A-5	0-10	0-10	85-100	80-100	45-70
	3-10	Sandy loam, silt loam, gravelly loam	ML, SC-SM, CL-ML, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	10-21	Sandy loam, silt loam, gravelly loam	CL, CL-ML, SC-SM, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	21-28	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-95	55-90	30-80
	28-60	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-100	55-100	30-90
3020:									
Indianola-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loamy sand	SM	A-1, A-2	0	0	95-100	90-100	45-75
	6-17	Loamy sand, loamy fine sand	SM	A-1, A-2, A-4	0	0	95-100	90-100	45-90
	17-27	Loamy fine sand, sand	SM, SP-SM, SC-SM	A-2, A-4, A-1	0	0	85-100	80-100	40-90
	27-37	Loamy sand, sand	SP-SM, SM, SC-SM	A-1, A-2	0	0	90-100	85-100	40-75
	37-60	Sand, loamy sand	SC-SM, SM, SP-SM	A-1, A-2	0	0	90-100	85-100	40-75

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
3021:									
Indianola-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loamy sand	SM	A-1, A-2	0	0	95-100	90-100	45-75
	6-17	Loamy sand, loamy fine sand	SM	A-1, A-2, A-4	0	0	95-100	90-100	45-90
	17-27	Loamy fine sand, sand	SM, SP-SM, SC-SM	A-2, A-4, A-1	0	0	85-100	80-100	40-90
	27-37	Loamy sand, sand	SP-SM, SM, SC-SM	A-1, A-2	0	0	90-100	85-100	40-75
	37-60	Sand, loamy sand	SC-SM, SM, SP-SM	A-1, A-2	0	0	90-100	85-100	40-75
3022:									
Aquic Dystroxerepts, coastal bluffs	0-4	Slightly decomposed plant material	PT	A-8	0	0	100	100	100
	4-7	Moderately decomposed plant material	PT	A-8	0	0	100	100	100
	7-17	Loamy sand	SM	A-1	0	0	85-100	80-100	40-75
	17-41	Silt loam, fine sandy loam, loamy fine sand	CL, ML	A-4, A-2	0	0	85-100	80-100	55-10
	41-55	Silt loam, fine sandy loam	CL, ML	A-4, A-2	0	0	85-100	80-100	55-10
	55-63	Silt loam, fine sandy loam, loamy fine sand	CL, ML	A-4, A-2	0	0	85-100	80-100	55-10
Oxyaquic Xerorthents----	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	100
	2-5	Moderately decomposed plant material	PT	A-8	0	0	100	100	100
	5-9	Sand	SW-SM	A-1-b	0	0	100	100	50-70
	9-11	Sand, sandy loam	SM, SW-SM	A-1-b, A-4	0	0	95-100	90-100	45-70
	11-19	Loamy sand, sand	SW-SM, SM	A-1-b	0	0	95-100	90-100	45-70
	19-36	Sand, loamy sand	SW-SM, SM	A-1-b	0	0	95-100	90-100	45-70
	36-58	Loam, sandy loam, very fine sandy loam	ML, SM	A-4, A-2	0	0	95-100	90-100	55-95
	58-83	Loam, silt loam, very fine sandy loam	ML	A-6, A-4	0	0	100	95-100	85-10
Beaches---------	0-60	Stratified sand to gravel			---	---	---	---	---

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				*Pct*	*Pct*			
3024:									
Indianola-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loamy sand	SM	A-1, A-2	0	0	95-100	90-100	45-75
	6-17	Loamy sand, loamy fine sand	SM	A-1, A-2, A-4	0	0	95-100	90-100	45-90
	17-27	Loamy fine sand, sand	SM, SP-SM, SC-SM	A-2, A-4, A-1	0	0	85-100	80-100	40-90
	27-37	Loamy sand, sand	SP-SM, SM, SC-SM	A-1, A-2	0	0	90-100	85-100	40-75
	37-60	Sand, loamy sand	SC-SM, SM, SP-SM	A-1, A-2	0	0	90-100	85-100	40-75
3050:									
Hoypus----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-5	Sandy loam	SC-SM, SM	A-1, A-2	0	0-10	80-95	75-90	40-65
	5-20	Loamy sand, very gravelly loamy sand, very gravelly sandy loam	SM, SW-SM	A-2, A-1	0-10	0-15	35-95	30-90	20-70
	20-36	Very gravelly loamy sand, very gravelly sand	GP-GM, GW	A-1	0-10	0-15	20-55	15-50	5-45
	36-60	Extremely gravelly sand, very gravelly loamy sand	GW, GP-GM	A-1	0-10	0-15	20-55	15-50	10-45
3051:									
Snakelum--------	0-10	Coarse sandy loam	CL-ML, SC-SM, SM	A-4, A-2	0	0	75-100	70-100	40-95
	10-18	Sandy loam, fine sandy loam	SM	A-2, A-4	0	0	75-100	70-100	40-85
	18-24	Sandy loam, gravelly fine sandy loam	SM	A-2, A-4	0	0	50-100	45-100	30-85
	24-48	Gravelly loamy sand, loamy coarse sand	SM, SW-SM	A-1, A-2	0	0	55-100	50-100	25-75
	48-60	Very gravelly loamy coarse sand, coarse sand	SW-SM, SM, GW-GM	A-3, A-1, A-2	0	0	40-100	35-100	20-75

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number-- 4	10	40
	In				Pct	Pct			
3051:									
San Juan--------	0-4	Sandy loam	SM	A-2, A-4, A-1	0	0-10	75-100	70-100	40-70
	4-13	Gravelly loamy sand, loam, sandy loam	GP-GM, OL, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	13-19	Sandy loam, loam, gravelly loamy sand	ML, GP-GM, SM	A-1, A-4, A-2	0	0-10	50-100	45-100	25-95
	19-27	Gravelly loamy coarse sand, gravelly sandy loam, very gravelly loamy sand	GW-GM, SM	A-2, A-1	0	0-10	30-80	25-75	15-50
	27-41	Extremely gravelly loamy coarse sand, very gravelly loamy sand, extremely gravelly coarse sand	GP-GM, GM, GP	A-1	0	0-20	20-55	15-50	5-45
	41-62	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	15-55	10-50	5-45
	62-70	Very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GP-GM	A-1	0	0-20	20-55	15-50	5-45
3052:									
Everett---------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	2-9	Sandy loam	SM	A-1, A-2	0	0	80-95	75-90	40-65
	9-13	Gravelly sandy loam, loamy sand, very gravelly coarse sandy loam	GP-GM, SC-SM, SM	A-1, A-2	0-10	0-10	50-95	45-90	20-70
	13-30	Extremely gravelly loamy coarse sand, very gravelly coarse sand	GP, GW-GM, SM	A-1, A-2	0-10	0-10	25-85	20-80	10-60
	30-60	Fine sand, very gravelly loamy coarse sand, extremely gravelly coarse sand	GM, GP, GW-GM	A-1	0-10	0-10	20-40	15-35	10-30

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40
	In				Pct	Pct			
3052:									
Hoypus----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-5	Sandy loam	SC-SM, SM	A-1, A-2	0	0-10	80-95	75-90	40-65
	5-20	Loamy sand, very gravelly loamy sand, very gravelly sandy loam	SM, SW-SM	A-2, A-1	0-10	0-15	35-95	30-90	20-70
	20-36	Very gravelly loamy sand, very gravelly sand	GP-GM, GW	A-1	0-10	0-15	20-55	15-50	5-45
	36-60	Extremely gravelly sand, very gravelly loamy sand	GW, GP-GM	A-1	0-10	0-15	20-55	15-50	10-45
Utsalady--------	0-2	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-2	Loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	2-15	Gravelly loamy sand, loamy sand	SM	A-1, A-2	0	0-9	50-100	50-100	40-80
	15-31	Loamy sand, gravelly loamy sand	SM, GP-GM	A-2, A-1	0	0-9	50-100	50-100	40-80
	31-42	Loamy sand, gravelly loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	42-50	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
	50-55	Gravelly sand, loamy sand	SM	A-1, A-2	0	0-8	50-100	50-100	40-80
	55-60	Gravelly sand, sand	SP-SM	A-1, A-3	0	0-8	50-100	50-100	40-80
3053:									
Bozarth---------	0-10	Sandy loam	SM	A-4, A-2, A-5	0-10	0-10	94-100	89-100	55-70
	10-16	Sandy loam, loam, fine sandy loam	SM, ML, SC-SM	A-2, A-4, A-5	0-10	0-10	94-100	89-100	55-95
	16-19	Sandy loam, gravelly fine sandy loam, fine sandy loam	SM, SC-SM, ML	A-2, A-4	0-10	0-10	94-100	89-100	55-85
	19-23	Sandy loam, gravelly fine sandy loam, fine sandy loam	SM, SC-SM, CL	A-2, A-4	0-5	0-5	81-100	76-100	45-85
	23-35	Fine sandy loam, gravelly sandy loam, sandy loam	SM, SC-SM, SC, CL	A-4, A-2	0-5	0-5	81-100	76-100	45-85
	35-60	Sandy loam, gravelly loam, silt loam	ML, CL-ML, SM	A-2, A-4	0-5	0-5	75-100	70-100	40-10

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	10	40
	In				Pct	Pct			
3053:									
Ebeys-----------	0-6	Loam	ML, CL-ML	A-4	0	0	100	100	85-95
	6-15	Loam	SM, CL-ML	A-4, A-2	0	0	100	100	60-95
	15-23	Sandy loam	SM, SC-SM	A-2, A-4	0	0	100	100	50-75
	23-34	Loamy sand	SM	A-2	0	0	100	100	50-80
	34-50	Loamy sand	SM	A-2	0	0	100	100	50-80
	50-60	Fine sand	SM	A-2	0	0	100	100	50-80
3054:									
Hoypus----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-5	Sandy loam	SC-SM, SM	A-1, A-2	0	0-10	80-95	75-90	40-65
	5-20	Loamy sand, very gravelly loamy sand, very gravelly sandy loam	SM, SW-SM	A-2, A-1	0-10	0-15	35-95	30-90	20-70
	20-36	Very gravelly loamy sand, very gravelly sand	GP-GM, GW	A-1	0-10	0-15	20-55	15-50	5-45
	36-60	Extremely gravelly sand, very gravelly loamy sand	GW, GP-GM	A-1	0-10	0-15	20-55	15-50	10-45
5000:									
Cady------------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	75-95
	1-4	Loam	ML, OH	A-4, A-5	0-10	0-10	90-100	85-100	75-95
	4-16	Medium gravelly coarse sandy loam, fine sandy loam, gravelly loam	ML, SC-SM, GP-GM	A-1, A-2, A-4	0-5	0-15	40-100	35-100	10-95
	16-26	Unweathered bedrock			---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---
Doebay----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loam	ML, SM, OH	A-4, A-5	0	0	75-95	70-90	60-85
	6-16	Fine sandy loam, gravelly sandy loam	SC-SM, SM, GM	A-2, A-4, A-1	0	0	50-85	45-80	30-75
	16-21	Very gravelly loam, very gravelly sandy loam	GC, GW-GM, GC-GM	A-2, A-4, A-1	0-10	0-20	30-55	25-50	10-45
	21-35	Extremely gravelly sandy loam, very gravelly coarse sandy loam	GC-GM, GP, GP-GC	A-1	0-10	0-20	20-40	15-35	5-20
	35-45	Unweathered bedrock			---	---	---	---	---

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				*Pct*	*Pct*			
5000:									
Killebrew-------	0-1	Slightly decomposed plant material	PT	A-8	0	0	75-95	70-90	40-65
	1-5	Sandy loam	SM	A-1, A-2	0	0	75-95	70-90	40-65
	5-9	Sandy loam, gravelly loam	SM, GM, ML	A-2, A-1, A-4	0	0-10	50-95	45-90	30-85
	9-17	Gravelly sandy loam, loam	SM, SC-SM, CL	A-2, A-1, A-4	0	0-5	60-100	55-95	35-85
	17-27	Silt loam, loam	CL, GC	A-4, A-6, A-7	0	0	60-100	55-95	50-90
	27-60	Silt loam, gravelly sandy loam, loam	CL, GC	A-6, A-4	0	0	60-100	55-95	35-90
5001:									
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---
Haro------------	0-1	Loam	GM, ML, OH	A-4, A-5	0	0-10	70-100	70-100	60-95
	1-5	Gravelly sandy loam, gravelly loam	GP-GM, GM, ML	A-2, A-4, A-1, A-5	0	0-10	45-100	40-100	25-95
	5-11	Gravelly sandy loam, gravelly loam	GM, SC-SM, SM	A-1, A-2, A-4	0	0-10	50-100	45-100	30-70
	11-21	Unweathered bedrock			---	---	---	---	---
Hiddenridge-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	80-10
	1-3	Gravelly coarse sandy loam	GM, SM	A-2, A-1, A-5	0	0	55-95	50-90	30-85
	3-24	Very gravelly coarse sandy loam, gravelly sandy loam, gravelly loam	GW-GM, GM	A-2, A-5, A-1	0	0	30-70	25-65	10-65
	24-57	Very gravelly coarse sandy loam, extremely gravelly coarse sandy loam, very gravelly sandy loam	GC, GP, GP-GM	A-2, A-1	0	0-20	15-50	10-45	5-30
	57-60	Unweathered bedrock			---	---	---	---	---

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage pass sieve number: 4	10	40
	In				Pct	Pct			
5003:									
Doebay----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loam	ML, SM, OH	A-4, A-5	0	0	75-95	70-90	60-85
	6-16	Fine sandy loam, gravelly sandy loam	SC-SM, SM, GM	A-2, A-4, A-1	0	0	50-85	45-80	30-75
	16-21	Very gravelly loam, very gravelly sandy loam	GC, GW-GM, GC-GM	A-1, A-2, A-4	0-10	0-20	30-55	25-50	10-45
	21-35	Extremely gravelly sandy loam, very gravelly coarse sandy loam	GC-GM, GP, GP-GC	A-1	0-10	0-20	20-40	15-35	5-20
	35-45	Unweathered bedrock			---	---	---	---	---
Morancreek------	0-1	Slightly decomposed plant material	PT	A-8	0	0	85-100	80-100	45-70
	1-3	Sandy loam	SM	A-2, A-4, A-5	0-10	0-10	85-100	80-100	45-70
	3-10	Sandy loam, silt loam, gravelly loam	ML, SC-SM, CL-ML, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	10-21	Sandy loam, silt loam, gravelly loam	CL, CL-ML, SC-SM, SM	A-2, A-4, A-1	0-10	0-20	60-100	55-100	30-10
	21-28	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-95	55-90	30-80
	28-60	Sandy loam, gravelly coarse sandy loam, loamy fine sand	SC-SM, SM	A-1, A-2, A-4	0-5	0-15	60-100	55-100	30-90
Cady------------	0-1	Slightly decomposed plant material	PT	A-8	0	0	90-100	85-100	75-95
	1-4	Loam	ML, OH	A-4, A-5	0-10	0-10	90-100	85-100	75-95
	4-16	Medium gravelly coarse sandy loam, fine sandy loam, gravelly loam	ML, SC-SM, GP-GM	A-1, A-2, A-4	0-5	0-15	40-100	35-100	10-95
	16-26	Unweathered bedrock			---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---
5006:									
Cady------------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	75-95
	1-4	Loam	ML, OH	A-4, A-5	0-10	0-10	90-100	85-100	75-95
	4-16	Medium gravelly coarse sandy loam, fine sandy loam, gravelly loam	ML, SC-SM, GP-GM	A-1, A-2, A-4	0-5	0-15	40-100	35-100	10-95
	16-26	Unweathered bedrock			---	---	---	---	---

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage pass sieve number-: 4	Percentage pass sieve number-: 10	Percentage pass sieve number-: 40
	In				*Pct*	*Pct*			
5006:									
Doebay----------	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loam	ML, SM, OH	A-4, A-5	0	0	75-95	70-90	60-85
	6-16	Fine sandy loam, gravelly sandy loam	SC-SM, SM, GM	A-2, A-4, A-1	0	0	50-85	45-80	30-75
	16-21	Very gravelly loam, very gravelly sandy loam	GC, GW-GM, GC-GM	A-1, A-2, A-4	0-10	0-20	30-55	25-50	10-45
	21-35	Extremely gravelly sandy loam, very gravelly coarse sandy loam	GC-GM, GP, GP-GC	A-1	0-10	0-20	20-40	15-35	5-20
	35-45	Unweathered bedrock			---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---
5007:									
Haro------------	0-1	Loam	GM, ML, OH	A-4, A-5	0	0-10	70-100	70-100	60-95
	1-5	Gravelly sandy loam, gravelly loam	GP-GM, GM, ML	A-2, A-4, A-1, A-5	0	0-10	45-100	40-100	25-95
	5-11	Gravelly sandy loam, gravelly loam	GM, SC-SM, SM	A-1, A-2, A-4	0	0-10	50-100	45-100	30-70
	11-21	Unweathered bedrock			---	---	---	---	---
Hiddenridge-----	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	80-10
	1-3	Gravelly coarse sandy loam	GM, SM	A-2, A-1, A-5	0	0	55-95	50-90	30-85
	3-24	Very gravelly coarse sandy loam, gravelly sandy loam, gravelly loam	GW-GM, GM	A-2, A-5, A-1	0	0	30-70	25-65	10-65
	24-57	Very gravelly coarse sandy loam, extremely gravelly coarse sandy loam, very gravelly sandy loam	GC, GP, GP-GM	A-2, A-1	0	0-20	15-50	10-45	5-30
	57-60	Unweathered bedrock			---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---

Table 10.--Engineering Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage pass sieve number-		
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40
	In				Pct	Pct			
5015:									
Doebay, moist---	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	60-10
	1-6	Loam	ML, SM, OH	A-4, A-5	0	0	75-95	70-90	60-85
	6-16	Fine sandy loam, gravelly sandy loam	SC-SM, SM, GM	A-2, A-4, A-1	0	0	50-85	45-80	30-75
	16-21	Very gravelly loam, very gravelly sandy loam	GC, GW-GM, GC-GM	A-1, A-2, A-4	0-10	0-20	30-55	25-50	10-45
	21-35	Extremely gravelly sandy loam, very gravelly coarse sandy loam	GC-GM, GP, GP-GC	A-1	0-10	0-20	20-40	15-35	5-20
	35-45	Unweathered bedrock			---	---	---	---	---
Cady------------	0-1	Slightly decomposed plant material	PT	A-8	0	0	90-100	85-100	75-95
	1-4	Loam	ML, OH	A-4, A-5	0-10	0-10	90-100	85-100	75-95
	4-16	Medium gravelly coarse sandy loam, fine sandy loam, gravelly loam	ML, SC-SM, GP-GM	A-1, A-2, A-4	0-5	0-15	40-100	35-100	10-95
	16-26	Unweathered bedrock			---	---	---	---	---
Rock outcrop----	0-60	Unweathered bedrock			---	---	---	---	---
Aquic Dystroxerepts, bedrock hills--	0-1	Slightly decomposed plant material	PT	A-8	0	0	100	100	85-10
	1-10	Silt loam, gravelly sandy loam, gravelly loam	CL-ML, GM, GC-GM	A-1, A-4, A-2	0	0-10	45-95	40-90	25-85
	10-24	Silt loam, very gravelly loam, gravelly sandy loam	ML, GM, SM	A-4, A-1, A-2	0	0-25	50-95	45-90	25-85
	24-48	Sandy loam, very gravelly loamy sand, gravelly coarse sandy loam	GM, SP-SM, SM	A-2, A-1	0	0-25	45-95	40-90	20-70
	48-58	Unweathered bedrock			---	---	---	---	---

Physical Soil Properties

Table 11 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the county. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (K_{sat}), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity. The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and

management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (K_{sat}). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the “National Soil Survey Handbook,” which is available in local offices of the Natural Resources Conservation Service or on the Internet.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Table 11.--Physical Soil Properties

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Win
apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion
										Kw
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*In/hr*	*In/in*	*Pct*	*Pct*	
994:										
Urban land.										
995:										
Water, miscellaneous.										
996:										
Dumps.										
997:										
Pits, gravel.										
998:										
Water, saline.										
999:										
Water, fresh.										
1005:										
Shalcar-------------	0-3	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	3-11	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	11-22	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	22-27	25-70	15-70	2-18	1.20-1.50	0.2-6	0.13-0.15	0.0-2.9	0.5-1.0	.32
	27-44	25-100	5-70	2-18	1.20-1.50	0.6-20	0.19-0.21	0.0-2.9	0.5-1.0	.55
	44-60	25-70	15-70	2-18	1.20-1.50	0.2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24
Shalcar, drained----	0-3	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	3-11	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	11-22	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	22-27	25-70	15-70	2-18	1.20-1.50	0.2-6	0.13-0.15	0.0-2.9	0.5-1.0	.32
	27-44	25-100	5-70	2-18	1.20-1.50	0.6-20	0.19-0.21	0.0-2.9	0.5-1.0	.55
	44-60	25-70	15-70	2-18	1.20-1.50	0.2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1005:										
Semiahmoo	0-9	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	60-80	.02
	9-10	20-30	70-80	0-5	0.80-1.20	0.2-0.6	0.35-0.45	0.0-2.9	1.0-9.0	.37
	10-30	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	60-80	.02
	30-48	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	48-60	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	60-72	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	72-84	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
1006:										
Semiahmoo	0-9	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	60-80	.02
	9-10	20-30	70-80	0-5	0.80-1.20	0.2-0.6	0.35-0.45	0.0-2.9	1.0-9.0	.37
	10-30	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	60-80	.02
	30-48	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	48-60	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	60-72	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	72-84	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
Semiahmoo, drained	0-9	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	60-80	.02
	9-10	20-30	70-80	0-5	0.80-1.20	0.2-0.6	0.35-0.45	0.0-2.9	1.0-9.0	.37
	10-30	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	60-80	.02
	30-48	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	48-60	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	60-72	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	72-84	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
Shalcar	0-3	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	3-11	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	11-22	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	22-27	25-70	15-70	2-18	1.20-1.50	0.2-6	0.13-0.15	0.0-2.9	0.5-1.0	.32
	27-44	25-100	5-70	2-18	1.20-1.50	0.6-20	0.19-0.21	0.0-2.9	0.5-1.0	.55
	44-60	25-70	15-70	2-18	1.20-1.50	0.2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24
1016:										
Orcas	0-3	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	85-100	.02
	3-12	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	85-100	.02
	12-60	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	85-100	.02
1017:										
Zylstra	0-4	35-70	20-50	5-10	0.80-1.20	0.6-2	0.08-0.18	0.0-2.9	7.0-12	.20
	4-12	35-70	20-50	5-10	0.80-1.20	0.6-2	0.07-0.18	0.0-2.9	5.0-10	.17
	12-18	35-70	20-50	2-10	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.10
	18-32	35-70	20-50	3-18	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.15
	32-37	35-70	20-50	6-18	1.50-1.75	0.6-2	0.04-0.18	0.0-2.9	0.1-0.5	.20
	37-60	35-70	20-50	4-18	1.70-1.90	0.00-0.06	0.07-0.16	0.0-2.9	0.1-0.5	.15

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1017:										
Frostad-------------	0-1	0-20	0-70	0-35	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	35-50	30-50	5-18	0.80-1.20	0.7-2	0.12-0.19	0.6-3.2	7.0-12	.17
	6-16	55-75	15-40	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.20
	16-21	55-75	15-40	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.17
	21-60	40-75	15-40	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.6-3.2	0.2-1.0	.24
Frostad, drained----	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	35-50	30-50	5-18	0.80-1.20	0.7-2	0.12-0.19	0.6-3.2	7.0-12	.17
	6-16	35-50	30-50	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.20
	16-21	55-75	15-40	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.17
	21-60	55-75	15-40	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.6-3.2	0.2-1.0	.24
1018:										
Coupeville----------	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Mitchellbay, cool---	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	55-65	10-35	8-18	1.10-1.45	0.6-6	0.07-0.13	0.0-2.9	7.0-12	.10
	6-15	30-70	20-45	8-18	1.10-1.45	0.6-6	0.12-0.20	0.0-2.9	1.0-4.0	.10
	15-20	30-70	20-45	4-12	1.60-1.80	0.6-6	0.05-0.18	0.0-2.9	0.2-1.0	.20
	20-26	15-50	30-65	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.32
	26-38	15-50	35-65	18-35	1.50-1.75	0.2-2	0.09-0.21	3.0-5.9	0.2-1.0	.32
	38-60	15-50	35-65	12-27	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37
Coupeville, drained	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
1019:										
Morancreek, cool----	0-1	50-80	5-45	4-12	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-3	50-80	5-45	4-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.24
	3-10	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	1.0-4.0	.24
	10-21	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	0.5-2.0	.24
	21-28	50-85	5-45	5-14	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.20
	28-60	50-85	5-45	4-12	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.24

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1019:										
Limepoint-----------	0-6	15-50	50-80	7-18	0.80-1.20	0.2-2	0.15-0.21	0.0-2.9	10-25	.37
	6-14	15-50	30-75	7-18	0.80-1.20	0.2-2	0.10-0.21	0.0-2.9	5.0-10	.20
	14-31	50-100	0-50	0-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.02
	31-49	35-100	0-50	2-18	1.20-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.32
	49-58	35-100	0-50	2-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.20
	58-60	15-45	30-80	15-40	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37
Shalcar-------------	0-3	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	3-11	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	11-22	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	22-27	25-70	15-70	2-18	1.20-1.50	0.2-6	0.13-0.15	0.0-2.9	0.5-1.0	.32
	27-44	25-100	5-70	2-18	1.20-1.50	0.6-20	0.19-0.21	0.0-2.9	0.5-1.0	.55
	44-60	25-70	15-70	2-18	1.20-1.50	0.2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24
1020:										
Sholander, cool-----	0-8	30-55	30-50	8-18	1.10-1.45	0.6-2	0.10-0.18	0.0-2.9	7.0-12	.15
	8-16	60-85	5-35	2-12	1.50-1.80	2-6	0.07-0.13	0.0-2.9	0.2-1.0	.05
	16-28	60-90	5-30	0-8	1.50-1.70	6-20	0.03-0.08	0.0-2.9	0.2-1.0	.02
	28-51	65-95	0-30	0-5	1.50-1.70	20-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	51-60	35-70	30-50	8-18	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.28
Limepoint-----------	0-6	15-50	50-80	7-18	0.80-1.20	0.2-2	0.15-0.21	0.0-2.9	10-25	.37
	6-14	15-50	30-75	7-18	0.80-1.20	0.2-2	0.10-0.21	0.0-2.9	5.0-10	.20
	14-31	50-100	0-50	0-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.02
	31-49	35-100	0-50	2-18	1.20-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.32
	49-58	35-100	0-50	2-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.20
	58-60	15-45	30-80	15-40	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37
Shalcar-------------	0-3	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	3-11	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	11-22	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	22-27	25-70	15-70	2-18	1.20-1.50	0.2-6	0.13-0.15	0.0-2.9	0.5-1.0	.32
	27-44	25-100	5-70	2-18	1.20-1.50	0.6-20	0.19-0.21	0.0-2.9	0.5-1.0	.55
	44-60	25-70	15-70	2-18	1.20-1.50	0.2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1021:										
Sholander, cool-----	0-8	30-55	30-50	8-18	1.10-1.45	0.6-2	0.10-0.18	0.0-2.9	7.0-12	.15
	8-16	60-85	5-35	2-12	1.50-1.80	2-6	0.07-0.13	0.0-2.9	0.2-1.0	.05
	16-28	60-90	5-30	0-8	1.50-1.70	6-20	0.03-0.08	0.0-2.9	0.2-1.0	.02
	28-51	65-95	0-30	0-5	1.50-1.70	20-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	51-60	35-70	30-50	8-18	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.28
Spieden-------------	0-4	20-45	50-75	6-18	0.80-1.20	0.2-0.6	0.26-0.37	0.0-2.9	10-25	.28
	4-11	25-50	30-65	6-18	0.80-1.45	0.2-6	0.15-0.21	0.0-2.9	7.0-12	.28
	11-24	80-95	0-20	0-5	1.50-1.70	6-100	0.04-0.08	0.0-2.9	0.2-1.0	.05
	24-36	80-95	0-20	0-5	1.50-1.70	6-100	0.03-0.07	0.0-2.9	0.2-1.0	.02
	36-48	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	48-60	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
Spieden, drained----	0-4	20-45	50-75	6-18	0.80-1.20	0.2-0.6	0.26-0.37	0.0-2.9	10-25	.28
	4-11	25-50	30-65	6-18	0.80-1.45	0.2-6	0.15-0.21	0.0-2.9	7.0-12	.28
	11-24	80-95	0-20	0-5	1.50-1.70	6-100	0.04-0.08	0.0-2.9	0.2-1.0	.05
	24-36	80-95	0-20	0-5	1.50-1.70	6-100	0.03-0.07	0.0-2.9	0.2-1.0	.02
	36-48	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	48-60	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
Sucia, cool---------	0-8	72-88	5-23	2-8	1.25-1.50	6-20	0.05-0.08	0.0-2.9	7.0-12	.05
	8-17	72-95	5-23	0-5	1.25-1.50	6-100	0.04-0.14	0.0-2.9	1.0-4.0	.10
	17-31	72-95	5-23	0-5	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	31-38	25-70	10-45	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.37
	38-60	10-60	10-65	18-35	1.70-1.90	0.2-0.6	0.00-0.00	3.0-5.9	0.2-1.0	.55
1022:										
Coveland, cool------	0-4	30-50	30-50	7-18	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.20
	4-9	15-65	25-70	10-25	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	2.0-7.0	.20
	9-20	15-80	15-80	5-25	1.60-1.80	0.6-6	0.09-0.13	0.0-2.9	0.2-1.0	.20
	20-36	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.02
	36-44	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.49
	44-60	15-50	30-65	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
Coveland, cool, drained------------	0-4	30-50	30-50	7-18	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.20
	4-9	15-65	25-70	10-25	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	2.0-7.0	.20
	9-20	15-80	15-80	5-25	1.60-1.80	0.6-6	0.09-0.13	0.0-2.9	0.2-1.0	.20
	20-36	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.02
	36-44	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.49
	44-60	15-50	30-65	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*In/hr*	*In/in*	*Pct*	*Pct*	
1022:										
Coupeville----------	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Sucia, cool---------	0-8	72-88	5-23	2-8	1.25-1.50	6-20	0.05-0.08	0.0-2.9	7.0-12	.05
	8-17	72-95	5-23	0-5	1.25-1.50	6-100	0.04-0.14	0.0-2.9	1.0-4.0	.10
	17-31	72-95	5-23	0-5	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	31-38	25-70	10-45	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.37
	38-60	10-60	10-65	18-35	1.70-1.90	0.2-0.6	0.00-0.00	3.0-5.9	0.2-1.0	.55
1023:										
Coupeville----------	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Coupeville, drained	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Coveland, cool------	0-4	30-50	30-50	7-18	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.20
	4-9	15-65	25-70	10-25	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	2.0-7.0	.20
	9-20	15-80	15-80	5-25	1.60-1.80	0.6-6	0.09-0.13	0.0-2.9	0.2-1.0	.20
	20-36	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.02
	36-44	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.49
	44-60	15-50	30-65	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
1024:										
Limepoint-----------	0-6	15-50	50-80	7-18	0.80-1.20	0.2-2	0.15-0.21	0.0-2.9	10-25	.37
	6-14	15-50	30-75	7-18	0.80-1.20	0.2-2	0.10-0.21	0.0-2.9	5.0-10	.20
	14-31	50-100	0-50	0-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.02
	31-49	35-100	0-50	2-18	1.20-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.32
	49-58	35-100	0-50	2-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.20
	58-60	15-45	30-80	15-40	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1024:										
Sholander, cool-----	0-8	30-55	30-50	8-18	1.10-1.45	0.6-2	0.10-0.18	0.0-2.9	7.0-12	.15
	8-16	60-85	5-35	2-12	1.50-1.80	2-6	0.07-0.13	0.0-2.9	0.2-1.0	.05
	16-28	60-90	5-30	0-8	1.50-1.70	6-20	0.03-0.08	0.0-2.9	0.2-1.0	.02
	28-51	65-95	0-30	0-5	1.50-1.70	20-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	51-60	35-70	30-50	8-18	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.28
Limepoint, drained--	0-6	15-50	50-80	7-18	0.80-1.20	0.2-2	0.15-0.21	0.0-2.9	10-25	.37
	6-14	15-50	30-75	7-18	0.80-1.20	0.2-2	0.10-0.21	0.0-2.9	5.0-10	.20
	14-31	50-100	0-50	0-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.02
	31-49	35-100	0-50	2-18	1.20-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.32
	49-58	35-100	0-50	2-18	1.25-1.50	0.6-100	0.02-0.18	0.0-2.9	0.2-1.0	.20
	58-60	15-45	30-80	15-40	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37
Shalcar-------------	0-3	5-20	50-80	15-40	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	3-11	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	11-22	5-20	50-80	15-35	0.10-0.30	0.6-2	0.30-0.60	---	15-40	.02
	22-27	25-70	15-70	2-18	1.20-1.50	0.2-6	0.13-0.15	0.0-2.9	0.5-1.0	.32
	27-44	25-100	5-70	2-18	1.20-1.50	0.6-20	0.19-0.21	0.0-2.9	0.5-1.0	.55
	44-60	25-70	15-70	2-18	1.20-1.50	0.2-6	0.11-0.13	0.0-2.9	0.5-1.0	.24
1025:										
Beaches-------------	0-60	---	---	---	---	---	---	---	---	---
Endoaquents, tidal--	0-29	70-100	0-25	0-3	1.50-1.70	20-100	0.01-0.06	0.0-2.9	0.5-1.2	.02
	29-48	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	48-60	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-0.8	.02
Xerorthents---------	0-1	75-95	0-10	0-3	1.25-1.50	20-100	0.01-0.04	0.0-2.9	3.0-6.0	.02
	1-20	80-100	0-5	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	20-60	80-100	0-5	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1026:										
Coveland, prairie---	0-4	30-50	30-50	7-18	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.20
	4-9	15-65	25-70	10-25	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	2.0-7.0	.20
	9-20	15-80	15-80	5-25	1.60-1.80	0.6-6	0.09-0.13	0.0-2.9	0.2-1.0	.20
	20-36	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.02
	36-44	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.49
	44-60	15-50	30-65	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
Coveland, prairie, drained------------	0-4	30-50	30-50	7-18	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.20
	4-9	15-65	25-70	10-25	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	2.0-7.0	.20
	9-20	15-80	15-80	5-25	1.60-1.80	0.6-6	0.09-0.13	0.0-2.9	0.2-1.0	.20
	20-36	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.02
	36-44	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.49
	44-60	15-50	30-65	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
Coupeville, prairie	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Sucia, prairie------	0-8	72-88	5-23	2-8	1.25-1.50	6-20	0.05-0.08	0.0-2.9	7.0-12	.05
	8-17	72-95	5-23	0-5	1.25-1.50	6-100	0.04-0.14	0.0-2.9	1.0-4.0	.10
	17-31	72-95	5-23	0-5	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	31-38	25-70	10-45	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.37
	38-60	10-60	10-65	18-35	1.70-1.90	0.2-0.6	0.00-0.00	3.0-5.9	0.2-1.0	.55
1027:										
Coupeville, prairie	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Coupeville, prairie, drained------------	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1027:										
Coveland, prairie---	0-4	30-50	30-50	7-18	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.20
	4-9	15-65	25-70	10-25	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	2.0-7.0	.20
	9-20	15-80	15-80	5-25	1.60-1.80	0.6-6	0.09-0.13	0.0-2.9	0.2-1.0	.20
	20-36	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.02
	36-44	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.49
	44-60	15-50	30-65	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
1028:										
Orcas, drained------	0-3	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	85-100	.02
	3-12	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	85-100	.02
	12-60	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	85-100	.02
1051:										
Coupeville, prairie	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Ebeys---------------	0-6	35-50	30-50	8-15	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	6-15	35-70	20-50	5-15	0.80-1.45	0.6-6	0.11-0.18	0.0-2.9	7.0-12	.24
	15-23	55-85	10-45	2-10	1.10-1.50	2-20	0.06-0.13	0.0-2.9	1.0-4.0	.20
	23-34	70-95	5-30	0-5	1.50-1.70	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.10
	34-50	70-95	5-30	0-5	1.35-1.60	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.15
	50-60	70-95	5-30	0-5	1.34-1.60	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.05
Coupeville, prairie, drained------------	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
1052:										
Ebeys---------------	0-6	35-50	30-50	8-15	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	6-15	35-70	20-50	5-15	0.80-1.45	0.6-6	0.11-0.18	0.0-2.9	7.0-12	.24
	15-23	55-85	10-45	2-10	1.10-1.50	2-20	0.06-0.13	0.0-2.9	1.0-4.0	.20
	23-34	70-95	5-30	0-5	1.50-1.70	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.10
	34-50	70-95	5-30	0-5	1.35-1.60	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.15
	50-60	70-95	5-30	0-5	1.34-1.60	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.05

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1052:										
Coupeville, prairie	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Coupeville, prairie, drained------------	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
1053:										
Dugualla------------	0-11	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	11-20	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	20-26	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	26-60	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
Dugualla, protected	0-11	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	11-20	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	20-26	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
	26-60	---	---	10-35	0.10-0.30	0.6-2	0.30-0.60	---	70-90	.02
Endoaquents, tidal--	0-29	70-100	0-25	0-3	1.50-1.70	20-100	0.01-0.06	0.0-2.9	0.5-1.2	.02
	29-48	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	48-60	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-0.8	.02
1054:										
Puget, drained------	0-7	5-15	55-65	30-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37
	7-17	5-15	55-65	30-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37
	17-25	5-15	55-65	30-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37
	25-31	5-15	55-65	30-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37
	31-40	5-15	55-65	30-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	1.0-3.0	.37
	40-45	5-15	55-65	30-35	1.25-1.35	0.06-0.2	0.19-0.21	3.0-5.9	1.0-3.0	.37
	45-60	5-15	55-65	30-35	1.25-1.35	0.06-0.2	0.19-0.21	3.0-5.9	1.0-3.0	.37

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
1054:										
Endoaquents, tidal	0-29	70-100	0-25	0-3	1.50-1.70	20-100	0.01-0.06	0.0-2.9	0.5-1.2	.02
	29-48	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	48-60	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-0.8	.02
Xerorthents	0-1	75-95	0-10	0-3	1.25-1.50	20-100	0.01-0.04	0.0-2.9	3.0-6.0	.02
	1-20	80-100	0-5	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	20-60	80-100	0-5	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
1055:										
Urban land.										
Coupeville	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
Coveland	0-4	30-50	30-50	7-18	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.20
	4-9	15-65	25-70	10-25	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	2.0-7.0	.20
	9-20	15-80	15-80	5-25	1.60-1.80	0.6-6	0.09-0.13	0.0-2.9	0.2-1.0	.20
	20-36	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.02
	36-44	15-50	30-65	18-35	1.50-1.75	0.06-2	0.16-0.21	3.0-5.9	0.2-1.0	.49
	44-60	15-50	30-65	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
Hoypus	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	0-30	0-15	1.10-1.45	2-6	0.05-0.13	0.0-2.9	7.0-12	.05
	5-20	60-90	0-25	0-5	1.25-1.50	6-20	0.05-0.14	0.0-2.9	1.0-4.0	.02
	20-36	70-100	0-20	0-5	1.25-1.50	6-20	0.01-0.05	0.0-2.9	0.8-3.5	.02
	36-60	70-100	0-15	0-5	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
Whidbey	0-2	30-80	10-45	6-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-6	30-80	10-45	6-15	0.80-1.20	2-6	0.09-0.32	0.0-2.9	7.0-12	.15
	6-20	35-75	10-45	4-15	1.10-1.45	2-20	0.03-0.16	0.0-2.9	1.0-4.0	.05
	20-37	55-80	5-40	5-18	1.60-1.80	2-20	0.02-0.11	0.0-2.9	0.2-1.0	.05
	37-60	50-75	5-30	9-24	1.70-1.90	0.00-0.06	0.05-0.14	0.0-2.9	0.2-1.0	.10

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
2000:										
Whidbey-------------	0-2	30-80	10-45	6-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-6	30-80	10-45	6-15	0.80-1.20	2-6	0.09-0.32	0.0-2.9	7.0-12	.15
	6-20	35-75	10-45	4-15	1.10-1.45	2-20	0.03-0.16	0.0-2.9	1.0-4.0	.05
	20-37	55-80	5-40	5-18	1.60-1.80	2-20	0.02-0.11	0.0-2.9	0.2-1.0	.05
	37-60	50-75	5-30	9-24	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.10
Hoypus--------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	0-30	0-15	1.10-1.45	2-6	0.05-0.13	0.0-2.9	7.0-12	.05
	5-20	60-90	0-25	0-5	1.25-1.50	6-20	0.05-0.14	0.0-2.9	1.0-4.0	.02
	20-36	70-100	0-20	0-5	1.25-1.50	6-20	0.01-0.05	0.0-2.9	0.8-3.5	.02
	36-60	70-100	0-15	0-5	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
2010:										
Whidbey-------------	0-2	30-80	10-45	6-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-6	30-80	10-45	6-15	0.80-1.20	2-6	0.09-0.32	0.0-2.9	7.0-12	.15
	6-20	35-75	10-45	4-15	1.10-1.45	2-20	0.03-0.16	0.0-2.9	1.0-4.0	.05
	20-37	55-80	5-40	5-18	1.60-1.80	2-20	0.02-0.11	0.0-2.9	0.2-1.0	.05
	37-60	50-75	5-30	9-24	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.10
Hoypus--------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	0-30	0-15	1.10-1.45	2-6	0.05-0.13	0.0-2.9	7.0-12	.05
	5-20	60-90	0-25	0-5	1.25-1.50	6-20	0.05-0.14	0.0-2.9	1.0-4.0	.02
	20-36	70-100	0-20	0-5	1.25-1.50	6-20	0.01-0.05	0.0-2.9	0.8-3.5	.02
	36-60	70-100	0-15	0-5	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
2012:										
Elwha---------------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-6	50-75	20-50	5-18	1.10-1.45	2-6	0.08-0.10	0.1-2.8	1.0-4.0	.10
	6-14	50-75	20-50	5-18	1.10-1.45	2-6	0.08-0.12	0.6-3.2	1.0-4.0	.10
	14-26	50-75	20-50	5-18	1.10-1.45	2-6	0.08-0.12	0.6-3.2	0.8-2.0	.10
	26-35	50-75	20-50	5-18	1.60-1.80	0.6-2	0.06-0.08	0.7-3.2	0.2-1.0	.17
	35-44	50-75	20-50	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.7-3.2	0.2-1.0	.17
	44-60	50-75	20-50	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.7-3.2	0.2-1.0	.17
Zylstra-------------	0-4	35-70	20-50	5-10	0.80-1.20	0.6-2	0.08-0.18	0.0-2.9	7.0-12	.20
	4-12	35-70	20-50	5-10	0.80-1.20	0.6-2	0.07-0.18	0.0-2.9	5.0-10	.17
	12-18	35-70	20-50	2-10	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.10
	18-32	35-70	20-50	3-18	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.15
	32-37	35-70	20-50	6-18	1.50-1.75	0.6-2	0.04-0.18	0.0-2.9	0.1-0.5	.20
	37-60	35-70	20-50	4-18	1.70-1.90	0.00-0.06	0.07-0.16	0.0-2.9	0.1-0.5	.15

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
2012:										
Morancreek, cool----	0-1	50-80	5-45	4-12	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-3	50-80	5-45	4-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.24
	3-10	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	1.0-4.0	.24
	10-21	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	0.5-2.0	.24
	21-28	50-85	5-45	5-14	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.20
	28-60	50-85	5-45	4-12	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.24
Everett-------------	0-2	50-75	10-45	0-25	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-9	50-75	10-35	5-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.10
	9-13	50-85	5-35	2-12	1.10-1.45	2-6	0.12-0.23	0.0-2.9	1.0-4.0	.10
	13-30	70-95	5-25	0-5	1.10-1.50	6-20	0.01-0.05	0.0-2.9	0.5-3.0	.02
	30-60	70-95	5-25	0-4	1.50-1.60	6-100	0.01-0.03	0.0-2.9	0.2-1.0	.02
2013:										
Zylstra-------------	0-4	35-70	20-50	5-10	0.80-1.20	0.6-2	0.08-0.18	0.0-2.9	7.0-12	.20
	4-12	35-70	20-50	5-10	0.80-1.20	0.6-2	0.07-0.18	0.0-2.9	5.0-10	.17
	12-18	35-70	20-50	2-10	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.10
	18-32	35-70	20-50	3-18	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.15
	32-37	35-70	20-50	6-18	1.50-1.75	0.6-2	0.04-0.18	0.0-2.9	0.1-0.5	.20
	37-60	35-70	20-50	4-18	1.70-1.90	0.00-0.06	0.07-0.16	0.0-2.9	0.1-0.5	.15
Frostad-------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	35-50	30-50	5-18	0.80-1.20	0.7-2	0.12-0.19	0.6-3.2	7.0-12	.17
	6-16	55-65	30-50	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.20
	16-21	55-75	15-40	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.17
	21-60	40-75	20-40	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.6-3.2	0.2-1.0	.24
Elwha---------------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-6	50-75	20-50	5-18	1.10-1.45	2-6	0.08-0.10	0.1-2.8	1.0-4.0	.10
	6-14	50-75	20-50	5-18	1.10-1.45	2-6	0.08-0.12	0.6-3.2	1.0-4.0	.10
	14-26	50-75	20-50	5-18	1.10-1.45	2-6	0.08-0.12	0.6-3.2	0.8-2.0	.10
	26-35	50-75	20-50	5-18	1.60-1.80	0.6-2	0.06-0.08	0.7-3.2	0.2-1.0	.17
	35-44	50-75	20-50	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.7-3.2	0.2-1.0	.17
	44-60	50-75	20-50	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.7-3.2	0.2-1.0	.17
2016:										
Zylstra-------------	0-4	35-70	20-50	5-10	0.80-1.20	0.6-2	0.08-0.18	0.0-2.9	7.0-12	.20
	4-12	35-70	20-50	5-10	0.80-1.20	0.6-2	0.07-0.18	0.0-2.9	5.0-10	.17
	12-18	35-70	20-50	2-10	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.10
	18-32	35-70	20-50	3-18	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.15
	32-37	35-70	20-50	6-18	1.50-1.75	0.6-2	0.04-0.18	0.0-2.9	0.1-0.5	.20
	37-60	35-70	20-50	4-18	1.70-1.90	0.00-0.06	0.07-0.16	0.0-2.9	0.1-0.5	.15

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
2016:										
Alderwood-----------	0-1	50-70	20-40	5-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-10	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.10	0.0-2.9	7.0-12	.02
	10-18	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.08	0.0-2.9	1.0-4.0	.02
	18-36	50-70	20-35	5-15	1.60-1.80	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	36-60	10-30	45-70	18-35	1.70-1.90	0.00-0.06	0.12-0.21	3.0-5.9	0.2-1.0	.24
Everett-------------	0-2	50-75	10-45	0-25	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-9	50-75	10-35	5-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.10
	9-13	50-85	5-35	2-12	1.10-1.45	2-6	0.12-0.23	0.0-2.9	1.0-4.0	.10
	13-30	70-95	5-25	0-5	1.10-1.50	6-20	0.01-0.05	0.0-2.9	0.5-3.0	.02
	30-60	70-95	5-25	0-4	1.50-1.60	6-100	0.01-0.03	0.0-2.9	0.2-1.0	.02
Frostad-------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	35-50	30-50	5-18	0.80-1.20	0.7-2	0.12-0.19	0.6-3.2	7.0-12	.17
	6-16	35-50	30-50	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.20
	16-21	55-75	15-40	5-18	1.10-1.45	2-6	0.06-0.12	0.6-3.2	0.2-1.0	.17
	21-60	55-75	15-40	5-18	1.70-1.90	0.00-0.06	0.00-0.00	0.6-3.2	0.2-1.0	.24
2017:										
Bozarth-------------	0-10	40-70	20-50	2-10	1.10-1.45	2-6	0.09-0.18	0.0-2.9	7.0-12	.15
	10-16	40-70	15-50	2-17	1.10-1.45	2-6	0.09-0.18	0.0-2.9	5.0-9.0	.15
	16-19	55-75	15-45	2-17	1.10-1.45	2-6	0.09-0.15	0.0-2.9	3.0-7.0	.15
	19-23	55-75	15-45	2-17	1.60-1.80	2-6	0.08-0.15	0.0-2.9	0.5-1.0	.20
	23-35	55-75	15-45	2-17	1.60-1.80	2-6	0.08-0.15	0.0-2.9	0.2-1.0	.20
	35-60	30-60	20-60	5-17	1.70-1.80	0.00-0.06	0.00-0.00	0.0-2.9	0.2-0.8	.49
Pilepoint-----------	0-4	40-70	20-50	5-12	0.80-1.20	0.6-2	0.10-0.18	0.0-2.9	7.0-12	.24
	4-13	40-70	20-50	5-12	0.80-1.45	0.6-6	0.10-0.18	0.0-2.9	6.0-10	.24
	13-22	50-80	10-50	2-12	1.10-1.50	2-6	0.04-0.11	0.0-2.9	1.0-4.0	.02
	22-29	50-80	5-50	2-15	0.80-1.50	2-20	0.07-0.13	0.0-2.9	0.2-1.0	.10
	29-36	20-50	35-60	18-35	0.80-1.35	0.06-0.6	0.12-0.21	3.0-5.9	0.2-1.0	.37
	36-46	20-50	35-60	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
	46-60	20-50	35-60	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.49
2018:										
Sucia, cool---------	0-8	72-88	5-23	2-8	1.25-1.50	6-20	0.05-0.08	0.0-2.9	7.0-12	.05
	8-17	72-95	5-23	0-5	1.25-1.50	6-100	0.04-0.14	0.0-2.9	1.0-4.0	.10
	17-31	72-95	5-23	0-5	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	31-38	25-70	10-45	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.37
	38-60	10-60	10-65	18-35	1.70-1.90	0.2-0.6	0.00-0.00	3.0-5.9	0.2-1.0	.55

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
2018:										
Sholander, cool-----	0-8	30-55	30-50	8-18	1.10-1.45	0.6-2	0.10-0.18	0.0-2.9	7.0-12	.15
	8-16	60-85	5-35	2-12	1.50-1.80	2-6	0.07-0.13	0.0-2.9	0.2-1.0	.05
	16-28	60-90	5-30	0-8	1.50-1.70	6-20	0.03-0.08	0.0-2.9	0.2-1.0	.02
	28-51	65-95	0-30	0-5	1.50-1.70	20-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	51-60	35-70	30-50	8-18	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.28
2019:										
Mitchellbay, cool---	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	55-65	10-35	8-18	1.10-1.45	0.6-6	0.07-0.13	0.0-2.9	7.0-12	.10
	6-15	30-70	20-45	8-18	1.10-1.45	0.6-6	0.12-0.20	0.0-2.9	1.0-4.0	.10
	15-20	30-70	20-45	4-12	1.60-1.80	0.6-6	0.05-0.18	0.0-2.9	0.2-1.0	.20
	20-26	15-50	30-65	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.32
	26-38	15-50	35-65	18-35	1.50-1.75	0.2-2	0.09-0.21	3.0-5.9	0.2-1.0	.32
	38-60	15-50	35-65	12-27	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37
Coupeville----------	0-7	35-50	30-50	5-18	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	7-12	25-65	20-60	5-18	0.80-1.45	0.6-2	0.11-0.21	0.0-2.9	5.0-10	.24
	12-20	30-60	15-45	20-32	1.50-1.75	0.2-2	0.12-0.21	3.0-5.9	0.2-1.0	.37
	20-34	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	34-50	15-40	30-55	20-35	1.50-1.75	0.06-0.6	0.14-0.21	3.0-5.9	0.2-1.0	.37
	50-60	10-40	35-65	20-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.43
2023:										
Sucia, cool---------	0-8	72-88	5-23	2-8	1.25-1.50	6-20	0.05-0.08	0.0-2.9	7.0-12	.05
	8-17	72-95	5-23	0-5	1.25-1.50	6-100	0.04-0.14	0.0-2.9	1.0-4.0	.10
	17-31	72-95	5-23	0-5	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	31-38	25-70	10-45	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.37
	38-60	10-60	10-65	18-35	1.70-1.90	0.2-0.6	0.00-0.00	3.0-5.9	0.2-1.0	.55
Sholander, cool-----	0-8	30-55	30-50	8-18	1.10-1.45	0.6-2	0.10-0.18	0.0-2.9	7.0-12	.15
	8-16	60-85	5-35	2-12	1.50-1.80	2-6	0.07-0.13	0.0-2.9	0.2-1.0	.05
	16-28	60-90	5-30	0-8	1.50-1.70	6-20	0.03-0.08	0.0-2.9	0.2-1.0	.02
	28-51	65-95	0-30	0-5	1.50-1.70	20-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	51-60	35-70	30-50	8-18	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.28
Spieden-------------	0-4	20-45	50-75	6-18	0.80-1.20	0.2-0.6	0.26-0.37	0.0-2.9	10-25	.28
	4-11	25-50	30-65	6-18	0.80-1.45	0.2-6	0.15-0.21	0.0-2.9	7.0-12	.28
	11-24	80-95	0-20	0-5	1.50-1.70	6-100	0.04-0.08	0.0-2.9	0.2-1.0	.05
	24-36	80-95	0-20	0-5	1.50-1.70	6-100	0.03-0.07	0.0-2.9	0.2-1.0	.02
	36-48	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	48-60	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*In/hr*	*In/in*	*Pct*	*Pct*	
2024:										
Indianola-----------	0-1	75-95	5-20	0-8	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.08	0.0-2.9	7.0-12	.05
	6-17	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.11	0.0-2.9	1.0-4.0	.10
	17-27	75-95	5-20	0-8	1.25-1.50	6-100	0.03-0.11	0.0-2.9	0.5-2.0	.05
	27-37	75-95	5-20	0-8	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	37-60	75-95	5-20	0-8	1.35-1.60	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
Uselessbay----------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-3	65-95	5-30	7-10	1.25-1.50	6-20	0.06-0.08	0.0-2.9	7.0-12	.10
	3-8	65-95	5-30	7-8	1.25-1.50	6-20	0.06-0.11	0.0-2.9	0.5-1.0	.15
	8-15	75-95	10-20	3-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.10
	15-29	75-99	1-20	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	29-37	75-99	1-20	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	37-60	35-70	20-30	8-10	1.70-1.90	0.00-0.06	0.00-0.04	0.0-2.9	0.1-0.5	.10
Utsalady------------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-2	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.08	0.0-2.9	0.1-0.5	.10
	2-15	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.11	0.0-2.9	0.1-0.5	.10
	15-31	75-85	8-15	2-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.15
	31-42	75-85	8-15	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	42-50	85-95	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	50-55	75-90	8-15	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.28
	55-60	85-99	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
2025:										
Utsalady------------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-2	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.08	0.0-2.9	0.1-0.5	.10
	2-15	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.11	0.0-2.9	0.1-0.5	.10
	15-31	75-85	8-15	2-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.15
	31-42	75-85	8-15	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	42-50	85-95	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	50-55	75-90	8-15	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.28
	55-60	85-99	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
Uselessbay----------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-3	65-95	5-30	7-10	1.25-1.50	6-20	0.06-0.08	0.0-2.9	7.0-12	.10
	3-8	65-95	5-30	7-8	1.25-1.50	6-20	0.06-0.11	0.0-2.9	0.5-1.0	.15
	8-15	75-95	10-20	3-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.10
	15-29	75-99	1-20	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	29-37	75-99	1-20	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	37-60	35-70	20-30	8-10	1.70-1.90	0.00-0.06	0.00-0.04	0.0-2.9	0.1-0.5	.10

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
2025:										
Spieden	0-4	20-45	50-75	6-18	0.80-1.20	0.2-0.6	0.26-0.37	0.0-2.9	10-25	.28
	4-11	25-50	30-65	6-18	0.80-1.45	0.2-6	0.15-0.21	0.0-2.9	7.0-12	.28
	11-24	80-95	0-20	0-5	1.50-1.70	6-100	0.04-0.08	0.0-2.9	0.2-1.0	.05
	24-36	80-95	0-20	0-5	1.50-1.70	6-100	0.03-0.07	0.0-2.9	0.2-1.0	.02
	36-48	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	48-60	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
2026:										
Uselessbay	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-3	65-95	5-30	7-10	1.25-1.50	6-20	0.06-0.08	0.0-2.9	7.0-12	.10
	3-8	65-95	5-30	7-8	1.25-1.50	6-20	0.06-0.11	0.0-2.9	0.5-1.0	.15
	8-15	75-95	10-20	3-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.10
	15-29	75-99	1-20	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	29-37	75-99	1-20	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	37-60	35-70	20-30	8-10	1.70-1.90	0.00-0.06	0.00-0.04	0.0-2.9	0.1-0.5	.10
Utsalady	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-2	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.08	0.0-2.9	0.1-0.5	.10
	2-15	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.11	0.0-2.9	0.1-0.5	.10
	15-31	75-85	8-15	2-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.15
	31-42	75-85	8-15	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	42-50	85-95	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	50-55	75-90	8-15	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.28
	55-60	85-99	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
Spieden	0-4	20-45	50-75	6-18	0.80-1.20	0.2-0.6	0.26-0.37	0.0-2.9	10-25	.28
	4-11	25-50	30-65	6-18	0.80-1.45	0.2-6	0.15-0.21	0.0-2.9	7.0-12	.28
	11-24	80-95	0-20	0-5	1.50-1.70	6-100	0.04-0.08	0.0-2.9	0.2-1.0	.05
	24-36	80-95	0-20	0-5	1.50-1.70	6-100	0.03-0.07	0.0-2.9	0.2-1.0	.02
	36-48	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	48-60	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
2027:										
Utsalady	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-2	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.08	0.0-2.9	0.1-0.5	.10
	2-15	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.11	0.0-2.9	0.1-0.5	.10
	15-31	75-85	8-15	2-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.15
	31-42	75-85	8-15	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	42-50	85-95	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	50-55	75-90	8-15	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.28
	55-60	85-99	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
2027:										
Uselessbay----------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-3	65-95	5-30	7-10	1.25-1.50	6-20	0.06-0.08	0.0-2.9	7.0-12	.10
	3-8	65-95	5-30	7-8	1.25-1.50	6-20	0.06-0.11	0.0-2.9	0.5-1.0	.15
	8-15	75-95	10-20	3-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.10
	15-29	75-99	1-20	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	29-37	75-99	1-20	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
	37-60	35-70	20-30	8-10	1.70-1.90	0.00-0.06	0.00-0.04	0.0-2.9	0.1-0.5	.10
Spieden-------------	0-4	20-45	50-75	6-18	0.80-1.20	0.2-0.6	0.26-0.37	0.0-2.9	10-25	.28
	4-11	25-50	30-65	6-18	0.80-1.45	0.2-6	0.15-0.21	0.0-2.9	7.0-12	.28
	11-24	80-95	0-20	0-5	1.50-1.70	6-100	0.04-0.08	0.0-2.9	0.2-1.0	.05
	24-36	80-95	0-20	0-5	1.50-1.70	6-100	0.03-0.07	0.0-2.9	0.2-1.0	.02
	36-48	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
	48-60	80-100	0-20	0-5	1.50-1.70	6-100	0.03-0.06	0.0-2.9	0.2-1.0	.02
2052:										
Townsend------------	0-5	35-50	35-50	7-15	0.80-1.20	2-6	0.10-0.15	0.0-2.9	7.0-12	.10
	5-18	40-70	20-50	5-15	0.80-1.20	0.6-6	0.03-0.12	0.0-2.9	5.0-9.0	.05
	18-24	40-70	20-45	5-15	0.90-1.40	2-6	0.03-0.12	0.0-2.9	2.0-5.0	.05
	24-36	40-80	10-40	2-12	1.60-1.80	2-20	0.02-0.10	0.0-2.9	0.2-1.0	.05
	36-60	40-70	20-45	2-15	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.2-1.0	.10
San Juan------------	0-4	45-75	15-50	2-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.15
	4-13	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	6.0-12	.15
	13-19	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	3.0-6.0	.15
	19-27	65-85	5-35	0-8	1.10-1.50	2-20	0.01-0.06	0.0-2.9	1.0-4.0	.02
	27-41	75-95	5-25	0-5	1.50-1.70	6-20	0.01-0.04	0.0-2.9	0.2-1.0	.02
	41-62	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	62-70	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
2054:										
Zylstra-------------	0-4	35-70	20-50	5-10	0.80-1.20	0.6-2	0.08-0.18	0.0-2.9	7.0-12	.20
	4-12	35-70	20-50	5-10	0.80-1.20	0.6-2	0.07-0.18	0.0-2.9	5.0-10	.17
	12-18	35-70	20-50	2-10	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.10
	18-32	35-70	20-50	3-18	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.15
	32-37	35-70	20-50	6-18	1.50-1.75	0.6-2	0.04-0.18	0.0-2.9	0.1-0.5	.20
	37-60	35-70	20-50	4-18	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.1-0.5	.15

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
2054:										
Mitchellbay, cool---	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	55-65	10-35	8-18	1.10-1.45	0.6-6	0.07-0.13	0.0-2.9	7.0-12	.10
	6-15	30-70	20-45	8-18	1.10-1.45	0.6-6	0.12-0.20	0.0-2.9	1.0-4.0	.10
	15-20	30-70	20-45	4-12	1.60-1.80	0.6-6	0.05-0.18	0.0-2.9	0.2-1.0	.20
	20-26	15-50	30-65	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.32
	26-38	15-50	35-65	18-35	1.50-1.75	0.2-2	0.09-0.21	3.0-5.9	0.2-1.0	.32
	38-60	15-50	35-65	12-27	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37
2055:										
Zylstra-------------	0-4	35-70	20-50	5-10	0.80-1.20	0.6-2	0.08-0.18	0.0-2.9	7.0-12	.20
	4-12	35-70	20-50	5-10	0.80-1.20	0.6-2	0.07-0.18	0.0-2.9	5.0-10	.17
	12-18	35-70	20-50	2-10	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.10
	18-32	35-70	20-50	3-18	1.60-1.80	2-6	0.07-0.18	0.0-2.9	0.2-1.0	.15
	32-37	35-70	20-50	6-18	1.50-1.75	0.6-2	0.04-0.18	0.0-2.9	0.1-0.5	.20
	37-60	35-70	20-50	4-18	1.70-1.90	0.00-0.06	0.00-0.00	0.0-2.9	0.1-0.5	.15
Mitchellbay, cool---	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	55-65	10-35	8-18	1.10-1.45	0.6-6	0.07-0.13	0.0-2.9	7.0-12	.10
	6-15	30-70	20-45	8-18	1.10-1.45	0.6-6	0.12-0.20	0.0-2.9	1.0-4.0	.10
	15-20	30-70	20-45	4-12	1.60-1.80	0.6-6	0.05-0.18	0.0-2.9	0.2-1.0	.20
	20-26	15-50	30-65	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.32
	26-38	15-50	35-65	18-35	1.50-1.75	0.2-2	0.09-0.21	3.0-5.9	0.2-1.0	.32
	38-60	15-50	35-65	12-27	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.37
3001:										
Hoypus--------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	0-30	0-15	1.10-1.45	2-6	0.05-0.13	0.0-2.9	7.0-12	.05
	5-20	60-90	0-25	0-5	1.25-1.50	6-20	0.05-0.14	0.0-2.9	1.0-4.0	.02
	20-36	70-100	0-20	0-5	1.25-1.50	6-20	0.01-0.05	0.0-2.9	0.8-3.5	.02
	36-60	70-100	0-15	0-5	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
3003:										
Keystone------------	0-1	55-85	10-45	0-8	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-3	55-85	10-45	0-8	1.15-1.45	2-20	0.07-0.13	0.0-2.9	5.0-10	.15
	3-8	55-100	10-45	0-8	1.15-1.60	2-20	0.07-0.12	0.0-2.9	1.0-5.0	.15
	8-19	75-100	0-25	0-8	1.35-1.60	6-100	0.04-0.11	0.0-2.9	0.5-1.0	.05
	19-34	75-100	0-25	0-5	1.35-1.60	6-100	0.04-0.08	0.0-2.9	0.5-1.0	.02
	34-60	75-100	0-25	0-5	1.35-1.60	6-100	0.04-0.08	0.0-2.9	0.5-1.0	.05

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
3003:										
Utsalady------------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-2	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.08	0.0-2.9	0.1-0.5	.10
	2-15	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.11	0.0-2.9	0.1-0.5	.10
	15-31	75-85	8-15	2-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.15
	31-42	75-85	8-15	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	42-50	85-95	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	50-55	75-90	8-15	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.28
	55-60	85-99	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
Sucia, cool---------	0-8	72-88	5-23	2-8	1.25-1.50	6-20	0.05-0.08	0.0-2.9	7.0-12	.05
	8-17	72-95	5-23	0-5	1.25-1.50	6-100	0.04-0.14	0.0-2.9	1.0-4.0	.10
	17-31	72-95	5-23	0-5	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	31-38	25-70	10-45	18-35	1.50-1.75	0.2-2	0.14-0.21	3.0-5.9	0.2-1.0	.37
	38-60	10-60	10-65	18-35	1.70-1.90	0.2-0.6	0.00-0.00	3.0-5.9	0.2-1.0	.55
3005:										
San Juan------------	0-4	45-75	15-50	2-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.15
	4-13	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	6.0-12	.15
	13-19	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	3.0-6.0	.15
	19-27	65-85	5-35	0-8	1.10-1.50	2-20	0.01-0.06	0.0-2.9	1.0-4.0	.02
	27-41	75-95	5-25	0-5	1.50-1.70	6-20	0.01-0.04	0.0-2.9	0.2-1.0	.02
	41-62	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	62-70	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
3007:										
San Juan------------	0-4	45-75	15-50	2-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.15
	4-13	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	6.0-12	.15
	13-19	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	3.0-6.0	.15
	19-27	65-85	5-35	0-8	1.10-1.50	2-20	0.01-0.06	0.0-2.9	1.0-4.0	.02
	27-41	75-95	5-25	0-5	1.50-1.70	6-20	0.01-0.04	0.0-2.9	0.2-1.0	.02
	41-62	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	62-70	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
3008:										
Xerorthents---------	0-1	75-95	0-10	0-3	1.25-1.50	20-100	0.01-0.04	0.0-2.9	3.0-6.0	.02
	1-20	80-100	0-5	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	20-60	80-100	0-5	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion
										Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
3008:										
Endoaquents, tidal--	0-29	70-100	0-25	0-3	1.50-1.70	20-100	0.01-0.06	0.0-2.9	0.5-1.2	.02
	29-48	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	48-60	85-100	0-15	0-3	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-0.8	.02
Beaches-------------	0-60	---	---	---	---	---	---	---	---	---
3011:										
Everett-------------	0-2	50-75	10-45	0-25	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-9	50-75	10-35	5-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.10
	9-13	50-85	5-35	2-12	1.10-1.45	2-6	0.12-0.23	0.0-2.9	1.0-4.0	.10
	13-30	70-95	5-25	0-5	1.10-1.50	6-20	0.01-0.05	0.0-2.9	0.5-3.0	.02
	30-60	70-95	5-25	0-4	1.50-1.60	6-100	0.01-0.03	0.0-2.9	0.2-1.0	.02
Alderwood-----------	0-1	50-70	20-40	5-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-10	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.10	0.0-2.9	7.0-12	.02
	10-18	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.08	0.0-2.9	1.0-4.0	.02
	18-36	50-70	20-35	5-15	1.60-1.80	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	36-60	10-30	45-70	18-35	1.70-1.90	0.00-0.06	0.12-0.21	3.0-5.9	0.2-1.0	.24
3017:										
Everett-------------	0-2	50-75	10-45	0-25	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-9	50-75	10-35	5-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.10
	9-13	50-85	5-35	2-12	1.10-1.45	2-6	0.12-0.23	0.0-2.9	1.0-4.0	.10
	13-30	70-95	5-25	0-5	1.10-1.50	6-20	0.01-0.05	0.0-2.9	0.5-3.0	.02
	30-60	70-95	5-25	0-4	1.50-1.60	6-100	0.01-0.03	0.0-2.9	0.2-1.0	.02
Alderwood-----------	0-1	50-70	20-40	5-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-10	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.10	0.0-2.9	7.0-12	.02
	10-18	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.08	0.0-2.9	1.0-4.0	.02
	18-36	50-70	20-35	5-15	1.60-1.80	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	36-60	10-30	45-70	18-35	1.70-1.90	0.00-0.06	0.12-0.21	3.0-5.9	0.2-1.0	.24
3018:										
Everett-------------	0-2	50-75	10-45	0-25	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-9	50-75	10-35	5-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.10
	9-13	50-85	5-35	2-12	1.10-1.45	2-6	0.12-0.23	0.0-2.9	1.0-4.0	.10
	13-30	70-95	5-25	0-5	1.10-1.50	6-20	0.01-0.05	0.0-2.9	0.5-3.0	.02
	30-60	70-95	5-25	0-4	1.50-1.60	6-100	0.01-0.03	0.0-2.9	0.2-1.0	.02

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
3019:										
Everett-------------	0-2	50-75	10-45	0-25	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-9	50-75	10-35	5-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.10
	9-13	50-85	5-35	2-12	1.10-1.45	2-6	0.12-0.23	0.0-2.9	1.0-4.0	.10
	13-30	70-95	5-25	0-5	1.10-1.50	6-20	0.01-0.05	0.0-2.9	0.5-3.0	.02
	30-60	70-95	5-25	0-4	1.50-1.60	6-100	0.01-0.03	0.0-2.9	0.2-1.0	.02
Alderwood-----------	0-1	50-70	20-40	5-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-10	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.10	0.0-2.9	7.0-12	.02
	10-18	50-70	20-40	5-15	1.10-1.45	2-6	0.04-0.08	0.0-2.9	1.0-4.0	.02
	18-36	50-70	20-35	5-15	1.60-1.80	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	36-60	10-30	45-70	18-35	1.70-1.90	0.00-0.06	0.12-0.21	3.0-5.9	0.2-1.0	.24
Morancreek, cool----	0-1	50-80	5-45	4-12	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-3	50-80	5-45	4-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.24
	3-10	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	1.0-4.0	.24
	10-21	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	0.5-2.0	.24
	21-28	50-85	5-45	5-14	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.20
	28-60	50-85	5-45	4-12	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.24
3020:										
Indianola-----------	0-1	75-95	5-20	0-8	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.08	0.0-2.9	7.0-12	.05
	6-17	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.11	0.0-2.9	1.0-4.0	.10
	17-27	75-95	5-20	0-8	1.25-1.50	6-100	0.03-0.11	0.0-2.9	0.5-2.0	.05
	27-37	75-95	5-20	0-8	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	37-60	75-95	5-20	0-8	1.35-1.60	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
3021:										
Indianola-----------	0-1	75-95	5-20	0-8	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.08	0.0-2.9	7.0-12	.05
	6-17	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.11	0.0-2.9	1.0-4.0	.10
	17-27	75-95	5-20	0-8	1.25-1.50	6-100	0.03-0.11	0.0-2.9	0.5-2.0	.05
	27-37	75-95	5-20	0-8	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	37-60	75-95	5-20	0-8	1.35-1.60	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
3022:										
Aquic Dystroxerepts, coastal bluffs-----	0-4	75-85	5-20	0-5	0.10-0.30	6-100	0.30-0.60	---	60-95	---
	4-7	75-85	5-20	0-5	0.10-0.30	6-100	0.30-0.60	---	60-95	---
	7-17	75-85	5-20	0-5	1.25-1.50	6-20	0.05-0.06	0.0-1.1	1.0-4.0	.10
	17-41	25-80	5-70	0-18	0.80-1.45	6-20	0.09-0.20	0.0-4.0	0.2-0.8	.32
	41-55	25-80	5-70	0-18	0.80-1.45	6-20	0.09-0.20	0.0-4.0	0.2-0.8	.32
	55-63	25-80	5-70	0-18	0.80-1.45	0.3-11	0.09-0.20	0.0-4.0	0.2-0.8	.32

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
3022:										
Oxyaquic Xerorthents	0-2	90-100	2-10	0-3	0.10-0.30	6-100	0.30-0.60	---	60-95	---
	2-5	90-100	2-10	0-3	0.10-0.30	6-100	0.30-0.60	---	60-95	---
	5-9	90-100	2-10	0-3	1.25-1.50	20-100	0.04-0.04	0.0-0.7	4.0-8.0	.02
	9-11	65-100	2-30	0-5	0.80-1.50	3-100	0.04-0.11	0.0-1.1	1.0-4.0	.02
	11-19	80-100	2-15	0-5	1.25-1.50	20-100	0.04-0.06	0.0-1.1	0.2-1.0	.05
	19-36	80-100	2-15	0-5	1.25-1.50	20-100	0.04-0.06	0.0-1.1	0.2-0.8	.05
	36-58	45-70	25-50	0-8	0.80-1.45	1-6	0.11-0.14	0.0-1.8	0.2-0.8	.43
	58-83	35-70	25-60	3-20	1.70-1.90	0.00-0.06	0.00-0.00	0.6-4.4	0.2-0.8	.43
Beaches-------------	0-60	---	---	---	---	---	---	---	---	---
3024:										
Indianola-----------	0-1	75-95	5-20	0-8	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.08	0.0-2.9	7.0-12	.05
	6-17	75-95	5-20	0-8	1.25-1.50	6-100	0.06-0.11	0.0-2.9	1.0-4.0	.10
	17-27	75-95	5-20	0-8	1.25-1.50	6-100	0.03-0.11	0.0-2.9	0.5-2.0	.05
	27-37	75-95	5-20	0-8	1.50-1.70	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
	37-60	75-95	5-20	0-8	1.35-1.60	6-100	0.03-0.08	0.0-2.9	0.2-1.0	.05
3050:										
Hoypus--------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	0-30	0-15	1.10-1.45	2-6	0.05-0.13	0.0-2.9	7.0-12	.05
	5-20	60-90	0-25	0-5	1.25-1.50	6-20	0.05-0.14	0.0-2.9	1.0-4.0	.02
	20-36	70-100	0-20	0-5	1.25-1.50	6-20	0.01-0.05	0.0-2.9	0.8-3.5	.02
	36-60	70-100	0-15	0-5	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
3051:										
Snakelum------------	0-10	45-70	20-40	5-15	0.80-1.45	2-6	0.07-0.18	0.0-2.9	7.0-12	.02
	10-18	55-75	20-40	5-15	1.10-1.45	2-6	0.09-0.15	0.0-2.9	2.0-7.0	.10
	18-24	55-75	20-40	5-15	1.10-1.45	2-6	0.07-0.15	0.0-2.9	1.0-4.0	.17
	24-48	75-90	5-25	2-6	1.50-1.70	6-20	0.03-0.08	0.0-2.9	0.5-1.5	.02
	48-60	75-95	2-15	2-5	1.50-1.70	20-100	0.02-0.07	0.0-2.9	0.2-1.0	.02

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*In/hr*	*In/in*	*Pct*	*Pct*	
3051:										
San Juan------------	0-4	45-75	15-50	2-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.15
	4-13	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	6.0-12	.15
	13-19	45-75	15-50	2-12	0.80-1.50	2-20	0.07-0.13	0.0-2.9	3.0-6.0	.15
	19-27	65-85	5-35	0-8	1.10-1.50	2-20	0.01-0.06	0.0-2.9	1.0-4.0	.02
	27-41	75-95	5-25	0-5	1.50-1.70	6-20	0.01-0.04	0.0-2.9	0.2-1.0	.02
	41-62	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
	62-70	75-100	0-25	0-5	1.50-1.70	6-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
3052:										
Everett-------------	0-2	50-75	10-45	0-25	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	2-9	50-75	10-35	5-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.10
	9-13	50-85	5-35	2-12	1.10-1.45	2-6	0.12-0.23	0.0-2.9	1.0-4.0	.10
	13-30	70-95	5-25	0-5	1.10-1.50	6-20	0.01-0.05	0.0-2.9	0.5-3.0	.02
	30-60	70-95	5-25	0-4	1.50-1.60	6-100	0.01-0.03	0.0-2.9	0.2-1.0	.02
Hoypus--------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	0-30	0-15	1.10-1.45	2-6	0.05-0.13	0.0-2.9	7.0-12	.05
	5-20	60-90	0-25	0-5	1.25-1.50	6-20	0.05-0.14	0.0-2.9	1.0-4.0	.02
	20-36	70-100	0-20	0-5	1.25-1.50	6-20	0.01-0.05	0.0-2.9	0.8-3.5	.02
	36-60	70-100	0-15	0-5	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
Utsalady------------	0-2	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-2	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.08	0.0-2.9	0.1-0.5	.10
	2-15	75-85	8-15	2-5	1.25-1.50	20-100	0.06-0.11	0.0-2.9	0.1-0.5	.10
	15-31	75-85	8-15	2-5	1.25-1.50	20-100	0.03-0.11	0.0-2.9	0.1-0.5	.15
	31-42	75-85	8-15	2-5	1.50-1.70	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	42-50	85-95	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.05
	50-55	75-90	8-15	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.28
	55-60	85-99	1-5	2-5	1.35-1.60	20-100	0.03-0.08	0.0-2.9	0.1-0.5	.02
3053:										
Bozarth-------------	0-10	40-70	20-50	2-10	1.10-1.45	2-6	0.09-0.18	0.0-2.9	7.0-12	.15
	10-16	40-70	15-50	2-17	1.10-1.45	2-6	0.09-0.18	0.0-2.9	5.0-9.0	.15
	16-19	55-75	15-45	2-17	1.10-1.45	2-6	0.09-0.15	0.0-2.9	3.0-7.0	.15
	19-23	55-75	15-45	2-17	1.60-1.80	2-6	0.08-0.15	0.0-2.9	0.5-1.0	.20
	23-35	55-75	15-45	2-17	1.60-1.80	2-6	0.08-0.15	0.0-2.9	0.2-1.0	.20
	35-60	30-60	20-60	5-17	1.70-1.80	0.00-0.06	0.00-0.00	0.0-2.9	0.2-0.8	.49

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
3053:										
Ebeys----------------	0-6	35-50	30-50	8-15	0.80-1.20	0.6-2	0.16-0.18	0.0-2.9	7.0-12	.24
	6-15	35-70	20-50	5-15	0.80-1.45	0.6-6	0.11-0.18	0.0-2.9	7.0-12	.24
	15-23	55-85	10-45	2-10	1.10-1.50	2-20	0.06-0.13	0.0-2.9	1.0-4.0	.20
	23-34	70-95	5-30	0-5	1.50-1.70	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.10
	34-50	70-95	5-30	0-5	1.35-1.60	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.15
	50-60	70-95	5-30	0-5	1.34-1.60	6-100	0.05-0.08	0.0-2.9	0.2-1.0	.05
3054:										
Hoypus---------------	0-1	55-75	0-30	0-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	0-30	0-15	1.10-1.45	2-6	0.05-0.13	0.0-2.9	7.0-12	.05
	5-20	60-90	0-25	0-5	1.25-1.50	6-20	0.05-0.14	0.0-2.9	1.0-4.0	.02
	20-36	70-100	0-20	0-5	1.25-1.50	6-20	0.01-0.05	0.0-2.9	0.8-3.5	.02
	36-60	70-100	0-15	0-5	1.50-1.70	20-100	0.01-0.04	0.0-2.9	0.2-1.0	.02
5000:										
Cady-----------------	0-1	35-50	30-50	8-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-4	35-50	30-50	8-15	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.24
	4-16	40-75	20-50	5-15	0.80-1.20	2-6	0.08-0.27	0.0-2.9	1.0-4.0	.17
	16-26	---	---	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---	---	---
Doebay---------------	0-1	45-70	20-40	5-16	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	45-70	20-40	5-16	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.28
	6-16	50-75	20-40	5-16	1.10-1.45	0.6-6	0.14-0.25	0.0-2.9	1.0-4.0	.17
	16-21	50-75	20-40	5-16	0.80-1.30	0.6-6	0.05-0.14	0.0-2.9	0.5-2.0	.10
	21-35	60-80	15-30	2-12	1.10-1.45	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	35-45	---	---	---	---	---	---	---	---	---
Killebrew------------	0-1	55-75	15-35	5-18	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-5	55-75	15-35	5-18	1.10-1.45	2-6	0.10-0.12	0.0-2.9	7.0-12	.10
	5-9	45-75	15-35	5-18	1.10-1.45	2-6	0.12-0.32	0.0-2.9	1.0-4.0	.15
	9-17	45-70	15-35	5-18	1.70-1.90	0.6-2	0.07-0.18	0.0-2.9	0.2-1.0	.10
	17-27	20-45	40-70	18-35	1.70-1.90	0.06-0.6	0.10-0.21	3.0-5.9	0.2-1.0	.49
	27-60	20-45	30-50	18-35	1.70-1.90	0.00-0.06	0.00-0.00	3.0-5.9	0.2-1.0	.32
5001:										
Rock outcrop---------	0-60	---	---	---	---	---	---	---	---	---
Haro-----------------	0-1	35-55	30-45	8-15	0.80-1.45	0.6-20	0.14-0.18	0.0-2.9	7.0-12	.17
	1-5	40-65	20-45	5-15	0.80-1.45	2-20	0.07-0.18	0.0-2.9	4.0-8.0	.15
	5-11	50-70	20-40	5-15	1.10-1.45	2-20	0.07-0.13	0.0-2.9	1.0-4.0	.10
	11-21	---	---	---	---	---	---	---	---	---

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
5001:										
Hiddenridge----------	0-1	50-75	10-45	5-18	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-3	50-75	10-45	5-18	1.10-1.45	2-6	0.06-0.09	0.0-2.9	7.0-12	.02
	3-24	45-75	10-45	5-18	1.10-1.45	2-20	0.03-0.08	0.0-2.9	4.0-9.0	.02
	24-57	55-80	5-40	0-18	1.30-1.50	2-20	0.02-0.07	0.0-2.9	0.2-1.0	.02
	57-60	---	---	---	---	---	---	---	---	---
5003:										
Doebay---------------	0-1	45-70	20-40	5-16	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	45-70	20-40	5-16	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.28
	6-16	50-75	20-40	5-16	1.10-1.45	0.6-6	0.14-0.25	0.0-2.9	1.0-4.0	.17
	16-21	50-75	20-40	5-16	0.80-1.30	0.6-6	0.05-0.14	0.0-2.9	0.5-2.0	.10
	21-35	60-80	15-30	2-12	1.10-1.45	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	35-45	---	---	---	---	---	---	---	---	---
Morancreek-----------	0-1	50-80	5-45	4-12	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-3	50-80	5-45	4-12	1.10-1.45	2-6	0.09-0.13	0.0-2.9	7.0-12	.24
	3-10	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	1.0-4.0	.24
	10-21	20-80	10-60	4-14	1.10-1.45	2-6	0.12-0.37	0.0-2.9	0.5-2.0	.24
	21-28	50-85	5-45	5-14	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.20
	28-60	50-85	5-45	4-12	1.60-1.80	2-6	0.05-0.13	0.0-2.9	0.2-1.0	.24
Cady-----------------	0-1	35-50	30-50	8-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-4	35-50	30-50	8-15	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.24
	4-16	40-75	20-50	5-15	0.80-1.20	2-6	0.08-0.27	0.0-2.9	1.0-4.0	.17
	16-26	---	---	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---	---	---
5006:										
Cady-----------------	0-1	35-50	30-50	8-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-4	35-50	30-50	8-15	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.24
	4-16	40-75	20-50	5-15	0.80-1.20	2-6	0.08-0.27	0.0-2.9	1.0-4.0	.17
	16-26	---	---	---	---	---	---	---	---	---
Doebay---------------	0-1	45-70	20-40	5-16	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	45-70	20-40	5-16	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.28
	6-16	50-75	20-40	5-16	1.10-1.45	0.6-6	0.14-0.25	0.0-2.9	1.0-4.0	.17
	16-21	50-75	20-40	5-16	0.80-1.30	0.6-6	0.05-0.14	0.0-2.9	0.5-2.0	.10
	21-35	60-80	15-30	2-12	1.10-1.45	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	35-45	---	---	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---	---	---

Table 11.--Physical Soil Properties--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion Kw
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct	
5007:										
Haro-----------------	0-1	35-55	30-45	8-15	0.80-1.45	0.6-20	0.14-0.18	0.0-2.9	7.0-12	.17
	1-5	40-65	20-45	5-15	0.80-1.45	2-20	0.07-0.18	0.0-2.9	4.0-8.0	.15
	5-11	50-70	20-40	5-15	1.10-1.45	2-20	0.07-0.13	0.0-2.9	1.0-4.0	.10
	11-21	---	---	---	---	---	---	---	---	---
Hiddenridge----------	0-1	50-75	10-45	5-18	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-3	50-75	10-45	5-18	1.10-1.45	2-6	0.06-0.09	0.0-2.9	7.0-12	.02
	3-24	45-75	10-45	5-18	1.10-1.45	2-20	0.03-0.08	0.0-2.9	4.0-9.0	.02
	24-57	55-80	5-40	0-18	1.30-1.50	2-20	0.02-0.07	0.0-2.9	0.2-1.0	.02
	57-60	---	---	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---	---	---
5015:										
Doebay, moist--------	0-1	45-70	20-40	5-16	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-6	45-70	20-40	5-16	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.28
	6-16	50-75	20-40	5-16	1.10-1.45	0.6-6	0.14-0.25	0.0-2.9	1.0-4.0	.17
	16-21	50-75	20-40	5-16	0.80-1.30	0.6-6	0.05-0.14	0.0-2.9	0.5-2.0	.10
	21-35	60-80	15-30	2-12	1.10-1.45	2-6	0.02-0.07	0.0-2.9	0.2-1.0	.05
	35-45	---	---	---	---	---	---	---	---	---
Cady-----------------	0-1	35-50	30-50	8-15	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-4	35-50	30-50	8-15	0.80-1.20	0.6-2	0.14-0.18	0.0-2.9	7.0-12	.24
	4-16	40-75	20-50	5-15	0.80-1.20	2-6	0.08-0.27	0.0-2.9	1.0-4.0	.17
	16-26	---	---	---	---	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---	---	---	---	---
Aquic Dystroxerepts, bedrock hills-------	0-1	25-70	20-70	5-12	0.10-0.30	6-100	0.30-0.60	---	60-90	---
	1-10	25-70	20-70	5-12	0.80-1.20	2-6	0.08-0.21	0.0-2.9	7.0-12	.20
	10-24	30-75	15-65	3-10	1.60-1.80	2-6	0.05-0.21	0.0-2.9	0.2-1.0	.24
	24-48	50-85	10-45	2-5	1.35-1.60	2-20	0.04-0.13	0.0-2.9	0.2-1.0	.20
	48-58	---	---	---	---	---	---	---	---	---

Chemical Properties

Table 12 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the county. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity (CEC) is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams. It commonly is measured at neutral pH of 7.0 (CEC-7), but it may be measured at some other stated pH value. Soils that have a low CEC hold fewer cations and may require more frequent applications of fertilizer than those that have a high CEC. The ability to retain cations minimizes the risk of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Table 12.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
994:						
Urban land.						
995:						
Water, miscellaneous.						
996:						
Dumps.						
997:						
Pits, gravel.						
998:						
Water, saline.						
999:						
Water, fresh.						
1005:						
Shalcar--------------	0-3	30-100	5.1-5.5	0	0	0
	3-11	30-100	6.1-6.5	0	0	0
	11-22	30-100	6.1-6.5	0	0	0
	22-27	2.0-16	6.6-7.3	0	0	0
	27-44	2.0-16	7.4-7.8	0	0	0
	44-60	2.0-16	7.9-8.4	0	0	0
Shalcar, drained-----	0-3	30-100	5.1-5.5	0	0	0
	3-11	30-100	6.1-6.5	0	0	0
	11-22	30-100	6.1-6.5	0	0	0
	22-27	2.0-16	6.6-7.3	0	0	0
	27-44	2.0-16	7.4-7.8	0	0	0
	44-60	2.0-16	7.9-8.4	0	0	0
Semiahmoo------------	0-9	50-100	5.6-6.0	0	0	0
	9-10	10-30	5.6-6.0	0	0	0
	10-30	50-100	5.6-6.0	0	0	0
	30-48	50-100	5.1-5.5	0	0	0
	48-60	50-100	6.6-7.3	0	0	0
	60-72	50-100	6.6-7.3	0	0	0
	72-84	50-100	7.4-7.8	0	0	0
1006:						
Semiahmoo------------	0-9	50-100	5.6-6.0	0	0	0
	9-10	10-30	5.6-6.0	0	0	0
	10-30	50-100	5.6-6.0	0	0	0
	30-48	50-100	5.1-5.5	0	0	0
	48-60	50-100	6.6-7.3	0	0	0
	60-72	50-100	6.6-7.3	0	0	0
	72-84	50-100	7.4-7.8	0	0	0
Semiahmoo, drained---	0-9	50-100	5.6-6.0	0	0	0
	9-10	10-30	5.6-6.0	0	0	0
	10-30	50-100	5.6-6.0	0	0	0
	30-48	50-100	5.1-5.5	0	0	0
	48-60	50-100	6.6-7.3	0	0	0
	60-72	50-100	6.6-7.3	0	0	0
	72-84	50-100	7.4-7.8	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	mmhos/cm	
1006:						
Shalcar	0-3	30-100	5.1-5.5	0	0	0
	3-11	30-100	6.1-6.5	0	0	0
	11-22	30-100	6.1-6.5	0	0	0
	22-27	2.0-16	6.6-7.3	0	0	0
	27-44	2.0-16	7.4-7.8	0	0	0
	44-60	2.0-16	7.9-8.4	0	0	0
1016:						
Orcas	0-3	50-100	4.0-4.5	0	0	0
	3-12	50-100	4.0-4.5	0	0	0
	12-60	50-100	4.0-4.5	0	0	0
1017:						
Zylstra	0-4	16-33	5.3-5.6	0	0	0
	4-12	12-27	5.4-6.0	0	0	0
	12-18	2.0-9.0	5.8-6.3	0	0	0
	18-32	2.0-18	6.2-6.6	0	0	0
	32-37	5.0-18	6.6-7.4	0	0	0
	37-60	4.0-18	7.2-7.6	0	0	0
Frostad	0-1	50-100	5.0-6.0	0	0	0
	1-6	18-37	5.6-6.0	0	0	0
	6-16	4.0-15	6.1-6.5	0	0	0
	16-21	4.0-15	5.6-6.0	0	0	0
	21-60	4.0-15	6.6-7.3	0	0	0
Frostad, drained	0-1	50-100	5.0-6.0	0	0	0
	1-6	18-37	5.6-6.0	0	0	0
	6-16	4.0-15	6.1-6.5	0	0	0
	16-21	4.0-15	5.6-6.0	0	0	0
	21-60	4.0-15	6.6-7.3	0	0	0
1018:						
Coupeville	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Mitchellbay, cool	0-1	50-100	5.0-6.0	0	0	0
	1-6	20-40	4.5-5.5	0	0	0
	6-15	5.0-20	5.6-6.0	0	0	0
	15-20	5.0-10	5.6-6.0	0	0	0
	20-26	15-30	6.1-6.5	0	0	0
	26-38	15-30	6.1-6.5	0	0	0
	38-60	10-25	6.6-7.3	0	0	0
Coupeville, drained	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
1019:						
Morancreek, cool-----	0-1	50-100	5.0-6.0	0	0	0
	1-3	15-35	5.6-6.0	0	0	0
	3-10	5.0-20	5.6-6.0	0	0	0
	10-21	5.0-15	5.6-6.0	0	0	0
	21-28	5.0-15	5.6-6.0	0	0	0
	28-60	5.0-10	6.1-6.5	0	0	0
Limepoint------------	0-6	13-34	5.6-6.0	0	0	0
	6-14	13-34	5.6-6.0	0	0	0
	14-31	0.0-16	6.1-6.5	0	0	0
	31-49	0.0-16	6.6-7.3	0	0	0
	49-58	0.0-16	6.6-7.3	0	0	0
	58-60	13-36	7.4-7.8	0	0	0
Shalcar--------------	0-3	30-100	5.1-5.5	0	0	0
	3-11	30-100	6.1-6.5	0	0	0
	11-22	30-100	6.1-6.5	0	0	0
	22-27	2.0-16	6.6-7.3	0	0	0
	27-44	2.0-16	7.4-7.8	0	0	0
	44-60	2.0-16	7.9-8.4	0	0	0
1020:						
Sholander, cool------	0-8	19-40	5.6-6.0	0	0	0
	8-16	2.0-11	5.6-6.0	0	0	0
	16-28	0.0-7.0	5.6-6.0	0	0	0
	28-51	0.0-4.0	5.6-6.0	0	0	0
	51-60	7.0-16	6.1-6.5	0	0	0
Limepoint------------	0-6	13-34	5.6-6.0	0	0	0
	6-14	13-34	5.6-6.0	0	0	0
	14-31	0.0-16	6.1-6.5	0	0	0
	31-49	0.0-16	6.6-7.3	0	0	0
	49-58	0.0-16	6.6-7.3	0	0	0
	58-60	13-36	7.4-7.8	0	0	0
Shalcar--------------	0-3	30-100	5.1-5.5	0	0	0
	3-11	30-100	6.1-6.5	0	0	0
	11-22	30-100	6.1-6.5	0	0	0
	22-27	2.0-16	6.6-7.3	0	0	0
	27-44	2.0-16	7.4-7.8	0	0	0
	44-60	2.0-16	7.9-8.4	0	0	0
1021:						
Sholander, cool------	0-8	19-40	5.6-6.0	0	0	0
	8-16	2.0-11	5.6-6.0	0	0	0
	16-28	0.0-7.0	5.6-6.0	0	0	0
	28-51	0.0-4.0	5.6-6.0	0	0	0
	51-60	7.0-16	6.1-6.5	0	0	0
Spieden--------------	0-4	23-66	6.1-6.5	0	0	0
	4-11	17-40	6.1-6.5	0	0	0
	11-24	0.0-4.0	6.6-7.3	0	0	0
	24-36	0.0-4.0	6.6-7.3	0	0	0
	36-48	0.0-4.0	6.6-7.3	0	0	0
	48-60	0.0-4.0	6.6-7.3	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
1021:						
Spieden, drained-----	0-4	23-66	6.1-6.5	0	0	0
	4-11	17-40	6.1-6.5	0	0	0
	11-24	0.0-4.0	6.6-7.3	0	0	0
	24-36	0.0-4.0	6.6-7.3	0	0	0
	36-48	0.0-4.0	6.6-7.3	0	0	0
	48-60	0.0-4.0	6.6-7.3	0	0	0
Sucia, cool----------	0-8	15-30	5.1-5.5	0	0	0
	8-17	0.0-10	5.6-6.0	0	0	0
	17-31	0.0-5.0	5.6-6.0	0	0	0
	31-38	15-30	6.1-6.5	0	0	0
	38-60	15-30	6.6-7.3	0	0	0
1022:						
Coveland, cool-------	0-4	16-37	6.1-6.5	0	0	0
	4-9	9.0-29	6.1-6.5	0	0	0
	9-20	3.0-17	6.6-7.3	0	0	0
	20-36	13-24	6.1-8.0	0	0	0
	36-44	13-24	6.1-8.0	0	0	0
	44-60	13-24	6.6-8.0	0	0	0
Coveland, cool, drained-------------	0-4	16-37	6.1-6.5	0	0	0
	4-9	9.0-29	6.1-6.5	0	0	0
	9-20	3.0-17	6.6-7.3	0	0	0
	20-36	13-24	6.1-8.0	0	0	0
	36-44	13-24	6.1-8.0	0	0	0
	44-60	13-24	6.6-8.0	0	0	0
Coupeville-----------	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Sucia, cool----------	0-8	15-30	5.1-5.5	0	0	0
	8-17	0.0-10	5.6-6.0	0	0	0
	17-31	0.0-5.0	5.6-6.0	0	0	0
	31-38	15-30	6.1-6.5	0	0	0
	38-60	15-30	6.6-7.3	0	0	0
1023:						
Coupeville-----------	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Coupeville, drained--	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
1023:						
Coveland, cool	0-4	16-37	6.1-6.5	0	0	0
	4-9	9.0-29	6.1-6.5	0	0	0
	9-20	3.0-17	6.6-7.3	0	0	0
	20-36	13-24	6.1-8.0	0	0	0
	36-44	13-24	6.1-8.0	0	0	0
	44-60	13-24	6.6-8.0	0	0	0
1024:						
Limepoint	0-6	13-34	5.6-6.0	0	0	0
	6-14	13-34	5.6-6.0	0	0	0
	14-31	0.0-16	6.1-6.5	0	0	0
	31-49	0.0-16	6.6-7.3	0	0	0
	49-58	0.0-16	6.6-7.3	0	0	0
	58-60	13-36	7.4-7.8	0	0	0
Sholander, cool	0-8	19-40	5.6-6.0	0	0	0
	8-16	2.0-11	5.6-6.0	0	0	0
	16-28	0.0-7.0	5.6-6.0	0	0	0
	28-51	0.0-4.0	5.6-6.0	0	0	0
	51-60	7.0-16	6.1-6.5	0	0	0
Limepoint, drained	0-6	13-34	5.6-6.0	0	0	0
	6-14	13-34	5.6-6.0	0	0	0
	14-31	0.0-16	6.1-6.5	0	0	0
	31-49	0.0-16	6.6-7.3	0	0	0
	49-58	0.0-16	6.6-7.3	0	0	0
	58-60	13-36	7.4-7.8	0	0	0
Shalcar	0-3	30-100	5.1-5.5	0	0	0
	3-11	30-100	6.1-6.5	0	0	0
	11-22	30-100	6.1-6.5	0	0	0
	22-27	2.0-16	6.6-7.3	0	0	0
	27-44	2.0-16	7.4-7.8	0	0	0
	44-60	2.0-16	7.9-8.4	0	0	0
1025:						
Beaches	0-60	---	---	---	---	---
Endoaquents, tidal	0-29	0.0-2.0	5.1-5.5	0	0.3-3.0	0-2
	29-48	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2
	48-60	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2
Xerorthents	0-1	4.0-12	5.6-6.0	0	0	0
	1-20	0.0-2.0	6.1-6.5	0	0	0
	20-60	0.0-2.0	6.6-7.3	0	0	0
1026:						
Coveland, prairie	0-4	16-37	6.1-6.5	0	0	0
	4-9	9.0-29	6.1-6.5	0	0	0
	9-20	3.0-17	6.6-7.3	0	0	0
	20-36	13-24	6.1-8.0	0	0	0
	36-44	13-24	6.1-8.0	0	0	0
	44-60	13-24	6.6-8.0	0	0	0
Coveland, prairie, drained	0-4	16-37	6.1-6.5	0	0	0
	4-9	9.0-29	6.1-6.5	0	0	0
	9-20	3.0-17	6.6-7.3	0	0	0
	20-36	13-24	6.1-8.0	0	0	0
	36-44	13-24	6.1-8.0	0	0	0
	44-60	13-24	6.6-8.0	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
1026:						
Coupeville, prairie--	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Sucia, prairie-------	0-8	15-30	5.1-5.5	0	0	0
	8-17	0.0-10	5.6-6.0	0	0	0
	17-31	0.0-5.0	5.6-6.0	0	0	0
	31-38	15-30	6.1-6.5	0	0	0
	38-60	15-30	6.6-7.3	0	0	0
1027:						
Coupeville, prairie--	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Coupeville, prairie, drained-------------	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Coveland, prairie----	0-4	16-37	6.1-6.5	0	0	0
	4-9	9.0-29	6.1-6.5	0	0	0
	9-20	3.0-17	6.6-7.3	0	0	0
	20-36	13-24	6.1-8.0	0	0	0
	36-44	13-24	6.1-8.0	0	0	0
	44-60	13-24	6.6-8.0	0	0	0
1028:						
Orcas, drained-------	0-3	50-100	4.0-4.5	0	0	0
	3-12	50-100	4.0-4.5	0	0	0
	12-60	50-100	4.0-4.5	0	0	0
1051:						
Coupeville, prairie--	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Ebeys----------------	0-6	20-40	5.6-6.0	0	0	0
	6-15	15-40	5.6-6.0	0	0	0
	15-23	0.0-15	6.1-6.5	0	0	0
	23-34	0.0-5.0	6.1-6.5	0	0	0
	34-50	0.0-5.0	6.6-7.3	0	0	0
	50-60	0.0-5.0	6.6-7.3	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
1051:						
Coupeville, prairie, drained	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
1052:						
Ebeys	0-6	20-40	5.6-6.0	0	0	0
	6-15	15-40	5.6-6.0	0	0	0
	15-23	0.0-15	6.1-6.5	0	0	0
	23-34	0.0-5.0	6.1-6.5	0	0	0
	34-50	0.0-5.0	6.6-7.3	0	0	0
	50-60	0.0-5.0	6.6-7.3	0	0	0
Coupeville, prairie	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Coupeville, prairie, drained	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
1053:						
Dugualla	0-11	50-150	6.1-6.5	0	40.0-60.0	0-5
	11-20	50-150	6.1-6.5	0	40.0-60.0	0-5
	20-26	50-150	6.6-7.3	0	40.0-60.0	0-5
	26-60	50-150	6.6-7.3	0	40.0-60.0	0-5
Dugualla, protected	0-11	50-150	6.1-6.5	0	40.0-60.0	0-5
	11-20	50-150	6.1-6.5	0	40.0-60.0	0-5
	20-26	50-150	6.6-7.3	0	40.0-60.0	0-5
	26-60	50-150	6.6-7.3	0	40.0-60.0	0-5
Endoaquents, tidal	0-29	0.0-2.0	5.1-5.5	0	0.3-3.0	0-2
	29-48	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2
	48-60	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2
1054:						
Puget, drained	0-7	10-20	5.6-6.5	0	0	0
	7-17	10-20	5.6-6.5	0	0	0
	17-25	10-20	5.6-6.5	0	0	0
	25-31	10-20	5.6-6.5	0	0	0
	31-40	10-20	5.6-6.5	0	0	0
	40-45	10-20	5.6-6.5	0	0	0
	45-60	10-20	5.6-6.5	0	0	0
Endoaquents, tidal	0-29	0.0-2.0	5.1-5.5	0	0.3-3.0	0-2
	29-48	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2
	48-60	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
1054:						
Xerorthents----------	0-1	4.0-12	5.6-6.0	0	0	0
	1-20	0.0-2.0	6.1-6.5	0	0	0
	20-60	0.0-2.0	6.6-7.3	0	0	0
1055:						
Urban land-----------	---	---	---	---	---	---
Coupeville-----------	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
Coveland-------------	0-4	16-37	6.1-6.5	0	0	0
	4-9	9.0-29	6.1-6.5	0	0	0
	9-20	3.0-17	6.6-7.3	0	0	0
	20-36	13-24	6.1-8.0	0	0	0
	36-44	13-24	6.1-8.0	0	0	0
	44-60	13-24	6.6-8.0	0	0	0
Hoypus---------------	0-1	50-100	5.0-6.0	0	0	0
	1-5	12-31	5.1-5.6	0	0	0
	5-20	0.0-10	5.1-5.6	0	0	0
	20-36	0.0-8.0	5.2-5.7	0	0	0
	36-60	0.0-4.0	5.5-6.1	0	0	0
Whidbey--------------	0-2	50-100	5.0-6.0	0	0	0
	2-6	15-30	5.4-6.1	0	0	0
	6-20	5.0-15	5.4-6.1	0	0	0
	20-37	3.0-10	6.0-6.6	0	0	0
	37-60	5.0-15	6.5-7.3	0	0	0
2000:						
Whidbey--------------	0-2	50-100	5.0-6.0	0	0	0
	2-6	15-30	5.4-6.1	0	0	0
	6-20	5.0-15	5.4-6.1	0	0	0
	20-37	3.0-10	6.0-6.6	0	0	0
	37-60	5.0-15	6.5-7.3	0	0	0
Hoypus---------------	0-1	50-100	5.0-6.0	0	0	0
	1-5	12-31	5.1-5.6	0	0	0
	5-20	0.0-10	5.1-5.6	0	0	0
	20-36	0.0-8.0	5.2-5.7	0	0	0
	36-60	0.0-4.0	5.5-6.1	0	0	0
2010:						
Whidbey--------------	0-2	50-100	5.0-6.0	0	0	0
	2-6	15-30	5.4-6.1	0	0	0
	6-20	5.0-15	5.4-6.1	0	0	0
	20-37	3.0-10	6.0-6.6	0	0	0
	37-60	5.0-15	6.5-7.3	0	0	0
Hoypus---------------	0-1	50-100	5.0-6.0	0	0	0
	1-5	12-31	5.1-5.6	0	0	0
	5-20	0.0-10	5.1-5.6	0	0	0
	20-36	0.0-8.0	5.2-5.7	0	0	0
	36-60	0.0-4.0	5.5-6.1	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
2012:						
Elwha	0-2	50-100	5.0-6.0	0	0	0
	2-6	5.0-20	6.1-6.5	0	0	0
	6-14	5.0-20	5.6-6.0	0	0	0
	14-26	5.0-15	5.6-6.0	0	0	0
	26-35	4.0-15	6.1-6.5	0	0	0
	35-44	4.0-15	6.6-7.3	0	0	0
	44-60	4.0-15	6.6-7.3	0	0	0
Zylstra	0-4	16-33	5.3-5.6	0	0	0
	4-12	12-27	5.4-6.0	0	0	0
	12-18	2.0-9.0	5.8-6.3	0	0	0
	18-32	2.0-18	6.2-6.6	0	0	0
	32-37	5.0-18	6.6-7.4	0	0	0
	37-60	4.0-18	7.2-7.6	0	0	0
Morancreek, cool	0-1	50-100	5.0-6.0	0	0	0
	1-3	15-35	5.6-6.0	0	0	0
	3-10	5.0-20	5.6-6.0	0	0	0
	10-21	5.0-15	5.6-6.0	0	0	0
	21-28	5.0-15	5.6-6.0	0	0	0
	28-60	5.0-10	6.1-6.5	0	0	0
Everett	0-2	50-100	5.0-6.0	0	0	0
	2-9	16-35	4.5-5.6	0	0	0
	9-13	2.0-17	4.5-5.6	0	0	0
	13-30	0.0-8.0	4.5-5.7	0	0	0
	30-60	0.0-2.0	5.6-6.5	0	0	0
2013:						
Zylstra	0-4	16-33	5.3-5.6	0	0	0
	4-12	12-27	5.4-6.0	0	0	0
	12-18	2.0-9.0	5.8-6.3	0	0	0
	18-32	2.0-18	6.2-6.6	0	0	0
	32-37	5.0-18	6.6-7.4	0	0	0
	37-60	4.0-18	7.2-7.6	0	0	0
Frostad	0-1	50-100	5.0-6.0	0	0	0
	1-6	18-37	5.6-6.0	0	0	0
	6-16	4.0-15	6.1-6.5	0	0	0
	16-21	4.0-15	5.6-6.0	0	0	0
	21-60	4.0-15	6.6-7.3	0	0	0
Elwha	0-2	50-100	5.0-6.0	0	0	0
	2-6	5.0-20	6.1-6.5	0	0	0
	6-14	5.0-20	5.6-6.0	0	0	0
	14-26	5.0-15	5.6-6.0	0	0	0
	26-35	4.0-15	6.1-6.5	0	0	0
	35-44	4.0-15	6.6-7.3	0	0	0
	44-60	4.0-15	6.6-7.3	0	0	0
2016:						
Zylstra	0-4	16-33	5.3-5.6	0	0	0
	4-12	12-27	5.4-6.0	0	0	0
	12-18	2.0-9.0	5.8-6.3	0	0	0
	18-32	2.0-18	6.2-6.6	0	0	0
	32-37	5.0-18	6.6-7.4	0	0	0
	37-60	4.0-18	7.2-7.6	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
2016:						
Alderwood	0-1	50-100	5.0-6.0	0	0	0
	1-10	15-40	6.1-6.5	0	0	0
	10-18	5.0-20	6.1-6.5	0	0	0
	18-36	5.0-15	6.1-6.5	0	0	0
	36-60	15-30	5.6-6.0	0	0	0
Everett	0-2	50-100	5.0-6.0	0	0	0
	2-9	16-35	4.5-5.6	0	0	0
	9-13	2.0-17	4.5-5.6	0	0	0
	13-30	0.0-8.0	4.5-5.7	0	0	0
	30-60	0.0-2.0	5.6-6.5	0	0	0
Frostad	0-1	50-100	5.0-6.0	0	0	0
	1-6	18-37	5.6-6.0	0	0	0
	6-16	4.0-15	6.1-6.5	0	0	0
	16-21	4.0-15	5.6-6.0	0	0	0
	21-60	4.0-15	6.6-7.3	0	0	0
2017:						
Bozarth	0-10	14-33	5.9-6.1	0	0	0
	10-16	10-30	5.9-6.1	0	0	0
	16-19	6.0-26	5.9-6.5	0	0	0
	19-23	2.0-14	5.9-7.0	0	0	0
	23-35	2.0-14	5.9-7.0	0	0	0
	35-60	4.0-14	5.9-7.1	0	0	0
Pilepoint	0-4	15-35	6.1-6.5	0	0	0
	4-13	14-29	6.1-6.5	0	0	0
	13-22	2.0-17	6.6-7.3	0	0	0
	22-29	2.0-13	6.6-7.3	0	0	0
	29-36	9.0-31	6.6-7.3	0	0	0
	36-46	9.0-31	6.6-7.3	0	0	0
	46-60	9.0-31	7.4-7.8	0	0	0
2018:						
Sucia, cool	0-8	15-30	5.1-5.5	0	0	0
	8-17	0.0-10	5.6-6.0	0	0	0
	17-31	0.0-5.0	5.6-6.0	0	0	0
	31-38	15-30	6.1-6.5	0	0	0
	38-60	15-30	6.6-7.3	0	0	0
Sholander, cool	0-8	19-40	5.6-6.0	0	0	0
	8-16	2.0-11	5.6-6.0	0	0	0
	16-28	0.0-7.0	5.6-6.0	0	0	0
	28-51	0.0-4.0	5.6-6.0	0	0	0
	51-60	7.0-16	6.1-6.5	0	0	0
2019:						
Mitchellbay, cool	0-1	50-100	5.0-6.0	0	0	0
	1-6	20-40	4.5-5.5	0	0	0
	6-15	5.0-20	5.6-6.0	0	0	0
	15-20	5.0-10	5.6-6.0	0	0	0
	20-26	15-30	6.1-6.5	0	0	0
	26-38	15-30	6.1-6.5	0	0	0
	38-60	10-25	6.6-7.3	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
2019:						
Coupeville	0-7	15-40	5.6-6.0	0	0	0
	7-12	10-35	6.1-6.5	0	0	0
	12-20	20-30	6.6-7.3	0	0	0
	20-34	20-30	6.6-7.3	0	0	0
	34-50	20-30	6.6-7.3	0	0	0
	50-60	15-25	6.6-7.3	0	0	0
2023:						
Sucia, cool	0-8	15-30	5.1-5.5	0	0	0
	8-17	0.0-10	5.6-6.0	0	0	0
	17-31	0.0-5.0	5.6-6.0	0	0	0
	31-38	15-30	6.1-6.5	0	0	0
	38-60	15-30	6.6-7.3	0	0	0
Sholander, cool	0-8	19-40	5.6-6.0	0	0	0
	8-16	2.0-11	5.6-6.0	0	0	0
	16-28	0.0-7.0	5.6-6.0	0	0	0
	28-51	0.0-4.0	5.6-6.0	0	0	0
	51-60	7.0-16	6.1-6.5	0	0	0
Spieden	0-4	23-66	6.1-6.5	0	0	0
	4-11	17-40	6.1-6.5	0	0	0
	11-24	0.0-4.0	6.6-7.3	0	0	0
	24-36	0.0-4.0	6.6-7.3	0	0	0
	36-48	0.0-4.0	6.6-7.3	0	0	0
	48-60	0.0-4.0	6.6-7.3	0	0	0
2024:						
Indianola	0-1	50-100	5.0-6.0	0	0	0
	1-6	10-30	6.6-7.3	0	0	0
	6-17	0.0-10	6.6-7.3	0	0	0
	17-27	0.0-10	6.6-7.3	0	0	0
	27-37	0.0-5.0	6.6-7.3	0	0	0
	37-60	0.0-5.0	6.6-7.3	0	0	0
Uselessbay	0-2	50-100	5.0-6.0	0	0	0
	2-3	18-30	5.1-6.5	0	0	0
	3-8	5-8	5.6-6.5	0	0	0
	8-15	2-5	5.6-6.5	0	0	0
	15-29	2-5	5.6-6.5	0	0	0
	29-37	2-5	5.6-6.5	0	0	0
	37-60	4-8	5.6-6.5	0	0	0
Utsalady	0-1	50-100	5.0-6.0	0	0	0
	1-2	2-5	5.6-6.0	0	0	0
	2-15	2-5	5.6-6.0	0	0	0
	15-31	2-5	5.6-6.0	0	0	0
	31-42	2-5	5.6-6.0	0	0	0
	42-50	2-5	5.6-6.0	0	0	0
	50-55	2-5	5.6-6.0	0	0	0
	55-60	2-5	5.6-6.0	0	0	0
2025:						
Utsalady	0-1	50-100	5.0-6.0	0	0	0
	1-2	2-5	5.6-6.0	0	0	0
	2-15	2-5	5.6-6.0	0	0	0
	15-31	2-5	5.6-6.0	0	0	0
	31-42	2-5	5.6-6.0	0	0	0
	42-50	2-5	5.6-6.0	0	0	0
	50-55	2-5	5.6-6.0	0	0	0
	55-60	2-5	5.6-6.0	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
2025:						
Uselessbay-----------	0-2	50-100	5.0-6.0	0	0	0
	2-3	18-30	5.1-6.5	0	0	0
	3-8	5-8	5.6-6.5	0	0	0
	8-15	2-5	5.6-6.5	0	0	0
	15-29	2-5	5.6-6.5	0	0	0
	29-37	2-5	5.6-6.5	0	0	0
	37-60	4-8	5.6-6.5	0	0	0
Spieden--------------	0-4	23-66	6.1-6.5	0	0	0
	4-11	17-40	6.1-6.5	0	0	0
	11-24	0.0-4.0	6.6-7.3	0	0	0
	24-36	0.0-4.0	6.6-7.3	0	0	0
	36-48	0.0-4.0	6.6-7.3	0	0	0
	48-60	0.0-4.0	6.6-7.3	0	0	0
2026:						
Uselessbay-----------	0-2	50-100	5.0-6.0	0	0	0
	2-3	18-30	5.1-6.5	0	0	0
	3-8	5-8	5.6-6.5	0	0	0
	8-15	2-5	5.6-6.5	0	0	0
	15-29	2-5	5.6-6.5	0	0	0
	29-37	2-5	5.6-6.5	0	0	0
	37-60	4-8	5.6-6.5	0	0	0
Utsalady-------------	0-1	50-100	5.0-6.0	0	0	0
	1-2	2-5	5.6-6.0	0	0	0
	2-15	2-5	5.6-6.0	0	0	0
	15-31	2-5	5.6-6.0	0	0	0
	31-42	2-5	5.6-6.0	0	0	0
	42-50	2-5	5.6-6.0	0	0	0
	50-55	2-5	5.6-6.0	0	0	0
	55-60	2-5	5.6-6.0	0	0	0
Spieden--------------	0-4	23-66	6.1-6.5	0	0	0
	4-11	17-40	6.1-6.5	0	0	0
	11-24	0.0-4.0	6.6-7.3	0	0	0
	24-36	0.0-4.0	6.6-7.3	0	0	0
	36-48	0.0-4.0	6.6-7.3	0	0	0
	48-60	0.0-4.0	6.6-7.3	0	0	0
2027:						
Utsalady-------------	0-1	50-100	5.0-6.0	0	0	0
	1-2	2-5	5.6-6.0	0	0	0
	2-15	2-5	5.6-6.0	0	0	0
	15-31	2-5	5.6-6.0	0	0	0
	31-42	2-5	5.6-6.0	0	0	0
	42-50	2-5	5.6-6.0	0	0	0
	50-55	2-5	5.6-6.0	0	0	0
	55-60	2-5	5.6-6.0	0	0	0
Uselessbay-----------	0-2	50-100	5.0-6.0	0	0	0
	2-3	18-30	5.1-6.5	0	0	0
	3-8	5-8	5.6-6.5	0	0	0
	8-15	2-5	5.6-6.5	0	0	0
	15-29	2-5	5.6-6.5	0	0	0
	29-37	2-5	5.6-6.5	0	0	0
	37-60	4-8	5.6-6.5	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
2027:						
Spieden--------------	0-4	23-66	6.1-6.5	0	0	0
	4-11	17-40	6.1-6.5	0	0	0
	11-24	0.0-4.0	6.6-7.3	0	0	0
	24-36	0.0-4.0	6.6-7.3	0	0	0
	36-48	0.0-4.0	6.6-7.3	0	0	0
	48-60	0.0-4.0	6.6-7.3	0	0	0
2052:						
Townsend-------------	0-5	15-40	6.1-6.5	0	0	0
	5-18	10-30	6.1-6.5	0	0	0
	18-24	5.0-20	6.1-7.3	0	0	0
	24-36	0.0-10	6.1-7.3	0	0	0
	36-60	0.0-15	6.1-7.3	0	0	0
San Juan-------------	0-4	12-35	5.1-5.5	0	0	0
	4-13	12-35	5.6-6.0	0	0	0
	13-19	6.0-21	6.1-6.5	0	0	0
	19-27	0.0-13	6.1-6.5	0	0	0
	27-41	0.0-4.0	6.6-7.3	0	0	0
	41-62	0.0-4.0	6.6-7.3	0	0	0
	62-70	0.0-4.0	6.6-7.3	0	0	0
2054:						
Zylstra--------------	0-4	16-33	5.3-5.6	0	0	0
	4-12	12-27	5.4-6.0	0	0	0
	12-18	2.0-9.0	5.8-6.3	0	0	0
	18-32	2.0-18	6.2-6.6	0	0	0
	32-37	5.0-18	6.6-7.4	0	0	0
	37-60	4.0-18	7.2-7.6	0	0	0
Mitchellbay, cool----	0-1	50-100	5.0-6.0	0	0	0
	1-6	20-40	4.5-5.5	0	0	0
	6-15	5.0-20	5.6-6.0	0	0	0
	15-20	5.0-10	5.6-6.0	0	0	0
	20-26	15-30	6.1-6.5	0	0	0
	26-38	15-30	6.1-6.5	0	0	0
	38-60	10-25	6.6-7.3	0	0	0
2055:						
Zylstra--------------	0-4	16-33	5.3-5.6	0	0	0
	4-12	12-27	5.4-6.0	0	0	0
	12-18	2.0-9.0	5.8-6.3	0	0	0
	18-32	2.0-18	6.2-6.6	0	0	0
	32-37	5.0-18	6.6-7.4	0	0	0
	37-60	4.0-18	7.2-7.6	0	0	0
Mitchellbay, cool----	0-1	50-100	5.0-6.0	0	0	0
	1-6	20-40	4.5-5.5	0	0	0
	6-15	5.0-20	5.6-6.0	0	0	0
	15-20	5.0-10	5.6-6.0	0	0	0
	20-26	15-30	6.1-6.5	0	0	0
	26-38	15-30	6.1-6.5	0	0	0
	38-60	10-25	6.6-7.3	0	0	0
3001:						
Hoypus---------------	0-1	50-100	5.0-6.0	0	0	0
	1-5	12-31	5.1-5.6	0	0	0
	5-20	0.0-10	5.1-5.6	0	0	0
	20-36	0.0-8.0	5.2-5.7	0	0	0
	36-60	0.0-4.0	5.5-6.1	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
3003:						
Keystone-------------	0-1	50-100	5.0-6.0	0	0	0
	1-3	8.0-25	5.5-6.2	0	0	0
	3-8	0.0-15	5.5-6.2	0	0	0
	8-19	0.0-7.0	5.4-6.3	0	0	0
	19-34	0.0-4.0	5.6-6.3	0	0	0
	34-60	0.0-4.0	6.0-6.6	0	0	0
Utsalady-------------	0-1	50-100	5.0-6.0	0	0	0
	1-2	2-5	5.6-6.0	0	0	0
	2-15	2-5	5.6-6.0	0	0	0
	15-31	2-5	5.6-6.0	0	0	0
	31-42	2-5	5.6-6.0	0	0	0
	42-50	2-5	5.6-6.0	0	0	0
	50-55	2-5	5.6-6.0	0	0	0
	55-60	2-5	5.6-6.0	0	0	0
Sucia, cool----------	0-8	15-30	5.1-5.5	0	0	0
	8-17	0.0-10	5.6-6.0	0	0	0
	17-31	0.0-5.0	5.6-6.0	0	0	0
	31-38	15-30	6.1-6.5	0	0	0
	38-60	15-30	6.6-7.3	0	0	0
3005:						
San Juan-------------	0-4	12-35	5.1-5.5	0	0	0
	4-13	12-35	5.6-6.0	0	0	0
	13-19	6.0-21	6.1-6.5	0	0	0
	19-27	0.0-13	6.1-6.5	0	0	0
	27-41	0.0-4.0	6.6-7.3	0	0	0
	41-62	0.0-4.0	6.6-7.3	0	0	0
	62-70	0.0-4.0	6.6-7.3	0	0	0
3007:						
San Juan-------------	0-4	12-35	5.1-5.5	0	0	0
	4-13	12-35	5.6-6.0	0	0	0
	13-19	6.0-21	6.1-6.5	0	0	0
	19-27	0.0-13	6.1-6.5	0	0	0
	27-41	0.0-4.0	6.6-7.3	0	0	0
	41-62	0.0-4.0	6.6-7.3	0	0	0
	62-70	0.0-4.0	6.6-7.3	0	0	0
3008:						
Xerorthents----------	0-1	4.0-12	5.6-6.0	0	0	0
	1-20	0.0-2.0	6.1-6.5	0	0	0
	20-60	0.0-2.0	6.6-7.3	0	0	0
Endoaquents, tidal---	0-29	0.0-2.0	5.1-5.5	0	0.3-3.0	0-2
	29-48	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2
	48-60	0.0-2.0	6.6-7.3	0	0.3-3.0	0-2
Beaches--------------	0-60	---	---	---	---	---
3011:						
Everett--------------	0-2	50-100	5.0-6.0	0	0	0
	2-9	16-35	4.5-5.6	0	0	0
	9-13	2.0-17	4.5-5.6	0	0	0
	13-30	0.0-8.0	4.5-5.7	0	0	0
	30-60	0.0-2.0	5.6-6.5	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
3011:						
Alderwood------------	0-1	50-100	5.0-6.0	0	0	0
	1-10	15-40	6.1-6.5	0	0	0
	10-18	5.0-20	6.1-6.5	0	0	0
	18-36	5.0-15	6.1-6.5	0	0	0
	36-60	15-30	5.6-6.0	0	0	0
3017:						
Everett--------------	0-2	50-100	5.0-6.0	0	0	0
	2-9	16-35	4.5-5.6	0	0	0
	9-13	2.0-17	4.5-5.6	0	0	0
	13-30	0.0-8.0	4.5-5.7	0	0	0
	30-60	0.0-2.0	5.6-6.5	0	0	0
Alderwood------------	0-1	50-100	5.0-6.0	0	0	0
	1-10	15-40	6.1-6.5	0	0	0
	10-18	5.0-20	6.1-6.5	0	0	0
	18-36	5.0-15	6.1-6.5	0	0	0
	36-60	15-30	5.6-6.0	0	0	0
3018:						
Everett--------------	0-2	50-100	5.0-6.0	0	0	0
	2-9	16-35	4.5-5.6	0	0	0
	9-13	2.0-17	4.5-5.6	0	0	0
	13-30	0.0-8.0	4.5-5.7	0	0	0
	30-60	0.0-2.0	5.6-6.5	0	0	0
3019:						
Everett--------------	0-2	50-100	5.0-6.0	0	0	0
	2-9	16-35	4.5-5.6	0	0	0
	9-13	2.0-17	4.5-5.6	0	0	0
	13-30	0.0-8.0	4.5-5.7	0	0	0
	30-60	0.0-2.0	5.6-6.5	0	0	0
Alderwood------------	0-1	50-100	5.0-6.0	0	0	0
	1-10	15-40	6.1-6.5	0	0	0
	10-18	5.0-20	6.1-6.5	0	0	0
	18-36	5.0-15	6.1-6.5	0	0	0
	36-60	15-30	5.6-6.0	0	0	0
Morancreek, cool-----	0-1	50-100	5.0-6.0	0	0	0
	1-3	15-35	5.6-6.0	0	0	0
	3-10	5.0-20	5.6-6.0	0	0	0
	10-21	5.0-15	5.6-6.0	0	0	0
	21-28	5.0-15	5.6-6.0	0	0	0
	28-60	5.0-10	6.1-6.5	0	0	0
3020:						
Indianola------------	0-1	50-100	5.0-6.0	0	0	0
	1-6	10-30	6.6-7.3	0	0	0
	6-17	0.0-10	6.6-7.3	0	0	0
	17-27	0.0-10	6.6-7.3	0	0	0
	27-37	0.0-5.0	6.6-7.3	0	0	0
	37-60	0.0-5.0	6.6-7.3	0	0	0
3021:						
Indianola------------	0-1	50-100	5.0-6.0	0	0	0
	1-6	10-30	6.6-7.3	0	0	0
	6-17	0.0-10	6.6-7.3	0	0	0
	17-27	0.0-10	6.6-7.3	0	0	0
	27-37	0.0-5.0	6.6-7.3	0	0	0
	37-60	0.0-5.0	6.6-7.3	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
3022:						
Aquic Dystroxerepts, coastal bluffs------	0-4	50-100	3.5-5.5	0	0	0
	4-7	50-100	3.5-5.5	0	0	0
	7-17	0.0-15	5.6-6.0	0	0	0
	17-41	0.0-20	6.1-6.5	0	0	0
	41-55	0.0-20	6.1-6.5	0	0	0
	55-63	0.0-20	6.1-6.5	0	0	0
Oxyaquic Xerorthents	0-2	50-100	3.5-5.5	0	0	0
	2-5	50-100	3.5-5.5	0	0	0
	5-9	0.0-20	5.6-6.0	0	0	0
	9-11	0.0-15	5.6-6.0	0	0	0
	11-19	0.0-5.0	5.6-6.0	0	0	0
	19-36	0.0-5.0	5.6-6.0	0	0	0
	36-58	0.0-10	6.1-6.5	0	0	0
	58-83	5.0-20	6.1-6.5	0	0	0
Beaches--------------	0-60	---	---	---	---	---
3024:						
Indianola------------	0-1	50-100	5.0-6.0	0	0	0
	1-6	10-30	6.6-7.3	0	0	0
	6-17	0.0-10	6.6-7.3	0	0	0
	17-27	0.0-10	6.6-7.3	0	0	0
	27-37	0.0-5.0	6.6-7.3	0	0	0
	37-60	0.0-5.0	6.6-7.3	0	0	0
3050:						
Hoypus---------------	0-1	50-100	5.0-6.0	0	0	0
	1-5	12-31	5.1-5.6	0	0	0
	5-20	0.0-10	5.1-5.6	0	0	0
	20-36	0.0-8.0	5.2-5.7	0	0	0
	36-60	0.0-4.0	5.5-6.1	0	0	0
3051:						
Snakelum-------------	0-10	15-40	5.1-5.5	0	0	0
	10-18	5.0-25	5.6-6.0	0	0	0
	18-24	5.0-20	5.6-6.0	0	0	0
	24-48	0.0-5.0	6.1-6.5	0	0	0
	48-60	0.0-5.0	6.1-6.5	0	0	0
San Juan-------------	0-4	12-35	5.1-5.5	0	0	0
	4-13	12-35	5.6-6.0	0	0	0
	13-19	6.0-21	6.1-6.5	0	0	0
	19-27	0.0-13	6.1-6.5	0	0	0
	27-41	0.0-4.0	6.6-7.3	0	0	0
	41-62	0.0-4.0	6.6-7.3	0	0	0
	62-70	0.0-4.0	6.6-7.3	0	0	0
3052:						
Everett--------------	0-2	50-100	5.0-6.0	0	0	0
	2-9	16-35	4.5-5.6	0	0	0
	9-13	2.0-17	4.5-5.6	0	0	0
	13-30	0.0-8.0	4.5-5.7	0	0	0
	30-60	0.0-2.0	5.6-6.5	0	0	0
Hoypus---------------	0-1	50-100	5.0-6.0	0	0	0
	1-5	12-31	5.1-5.6	0	0	0
	5-20	0.0-10	5.1-5.6	0	0	0
	20-36	0.0-8.0	5.2-5.7	0	0	0
	36-60	0.0-4.0	5.5-6.1	0	0	0

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
3052:						
Utsalady-------------	0-1	50-100	5.0-6.0	0	0	0
	1-2	2-5	5.6-6.0	0	0	0
	2-15	2-5	5.6-6.0	0	0	0
	15-31	2-5	5.6-6.0	0	0	0
	31-42	2-5	5.6-6.0	0	0	0
	42-50	2-5	5.6-6.0	0	0	0
	50-55	2-5	5.6-6.0	0	0	0
	55-60	2-5	5.6-6.0	0	0	0
3053:						
Bozarth--------------	0-10	14-33	5.9-6.1	0	0	0
	10-16	10-30	5.9-6.1	0	0	0
	16-19	6.0-26	5.9-6.5	0	0	0
	19-23	2.0-14	5.9-7.0	0	0	0
	23-35	2.0-14	5.9-7.0	0	0	0
	35-60	4.0-14	5.9-7.1	0	0	0
Ebeys----------------	0-6	20-40	5.6-6.0	0	0	0
	6-15	15-40	5.6-6.0	0	0	0
	15-23	0.0-15	6.1-6.5	0	0	0
	23-34	0.0-5.0	6.1-6.5	0	0	0
	34-50	0.0-5.0	6.6-7.3	0	0	0
	50-60	0.0-5.0	6.6-7.3	0	0	0
3054:						
Hoypus---------------	0-1	50-100	5.0-6.0	0	0	0
	1-5	12-31	5.1-5.6	0	0	0
	5-20	0.0-10	5.1-5.6	0	0	0
	20-36	0.0-8.0	5.2-5.7	0	0	0
	36-60	0.0-4.0	5.5-6.1	0	0	0
5000:						
Cady-----------------	0-1	50-100	5.0-6.0	0	0	0
	1-4	12-31	5.6-6.0	0	0	0
	4-16	4.0-21	5.6-6.0	0	0	0
	16-26	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---
Doebay---------------	0-1	50-100	5.6-6.0	0	0	0
	1-6	12-32	5.1-6.0	0	0	0
	6-16	4.0-22	5.1-6.0	0	0	0
	16-21	4.0-16	5.1-6.0	0	0	0
	21-35	2.0-11	5.1-6.0	0	0	0
	35-45	---	---	---	---	---
Killebrew------------	0-1	50-100	3.5-5.5	0	0	0
	1-5	15-40	4.5-5.5	0	0	0
	5-9	5.0-20	5.6-6.0	0	0	0
	9-17	5.0-15	5.6-6.0	0	0	0
	17-27	15-30	6.6-7.3	0	0	0
	27-60	15-30	6.6-7.3	0	0	0
5001:						
Rock outcrop---------	0-60	---	---	---	---	---
Haro-----------------	0-1	19-38	5.1-5.5	0	0	0
	1-5	10-27	5.1-5.5	0	0	0
	5-11	4.0-19	5.6-6.0	0	0	0
	11-21	---	---	---	---	---

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
5001:						
Hiddenridge----------	0-1	50-100	3.5-5.5	0	0	0
	1-3	16-40	5.1-5.5	0	0	0
	3-24	10-32	5.1-5.5	0	0	0
	24-57	0.0-16	5.1-5.5	0	0	0
	57-60	---	---	---	---	---
5003:						
Doebay---------------	0-1	50-100	5.6-6.0	0	0	0
	1-6	12-32	5.1-6.0	0	0	0
	6-16	4.0-22	5.1-6.0	0	0	0
	16-21	4.0-16	5.1-6.0	0	0	0
	21-35	2.0-11	5.1-6.0	0	0	0
	35-45	---	---	---	---	---
Morancreek-----------	0-1	50-100	5.0-6.0	0	0	0
	1-3	15-35	5.6-6.0	0	0	0
	3-10	5.0-20	5.6-6.0	0	0	0
	10-21	5.0-15	5.6-6.0	0	0	0
	21-28	5.0-15	5.6-6.0	0	0	0
	28-60	5.0-10	6.1-6.5	0	0	0
Cady-----------------	0-1	50-100	5.0-6.0	0	0	0
	1-4	12-31	5.6-6.0	0	0	0
	4-16	4.0-21	5.6-6.0	0	0	0
	16-26	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---
5006:						
Cady-----------------	0-1	50-100	5.0-6.0	0	0	0
	1-4	12-31	5.6-6.0	0	0	0
	4-16	4.0-21	5.6-6.0	0	0	0
	16-26	---	---	---	---	---
Doebay---------------	0-1	50-100	5.6-6.0	0	0	0
	1-6	12-32	5.1-6.0	0	0	0
	6-16	4.0-22	5.1-6.0	0	0	0
	16-21	4.0-16	5.1-6.0	0	0	0
	21-35	2.0-11	5.1-6.0	0	0	0
	35-45	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---
5007:						
Haro-----------------	0-1	19-38	5.1-5.5	0	0	0
	1-5	10-27	5.1-5.5	0	0	0
	5-11	4.0-19	5.6-6.0	0	0	0
	11-21	---	---	---	---	---
Hiddenridge----------	0-1	50-100	3.5-5.5	0	0	0
	1-3	16-40	5.1-5.5	0	0	0
	3-24	10-32	5.1-5.5	0	0	0
	24-57	0.0-16	5.1-5.5	0	0	0
	57-60	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---

Table 12.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbon-ate	Salinity	Sodium adsorption ratio
	In	*meq/100 g*	*pH*	*Pct*	*mmhos/cm*	
5015:						
Doebay, moist--------	0-1	50-100	5.6-6.0	0	0	0
	1-6	12-32	5.1-6.0	0	0	0
	6-16	4.0-22	5.1-6.0	0	0	0
	16-21	4.0-16	5.1-6.0	0	0	0
	21-35	2.0-11	5.1-6.0	0	0	0
	35-45	---	---	---	---	---
Cady-----------------	0-1	50-100	5.0-6.0	0	0	0
	1-4	12-31	5.6-6.0	0	0	0
	4-16	4.0-21	5.6-6.0	0	0	0
	16-26	---	---	---	---	---
Rock outcrop---------	0-60	---	---	---	---	---
Aquic Dystroxerepts, bedrock hills-------	0-1	50-100	3.5-5.5	0	0	0
	1-10	15-35	5.6-6.0	0	0	0
	10-24	0.0-10	5.6-6.0	0	0	0
	24-48	0.0-5.0	6.1-6.5	0	0	0
	48-58	---	---	---	---	---

Water Features

Table 13 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is

1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Table 13.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply rather than to individual months. Absence of an entry indicates that the feature is not a concern or that estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
994:								
Urban land	D							
		Jan-Dec	---	---	---	---	None	
995:								
Water, miscellaneous	---							
		Jan-Dec	---	---	---	---	None	
996:								
Dumps	---							
		Jan-Dec	---	---	---	---	None	
997:								
Pits, gravel	A							
		Jan-Dec	---	---	---	---	None	
998:								
Water, saline	---							
		Jan-Dec	---	---	---	---	None	
999:								
Water, fresh	---							
		Jan-Dec	---	---	---	---	None	
1005:								
Shalcar	D							
		January	0-8	>72	6-20	Very long	Frequent	
		February	0-8	>72	6-20	Very long	Frequent	
		March	0-12	>72	6-20	Very long	Frequent	
		April	0-12	>72	6-20	Very long	Frequent	
		May	0-12	>72	4-10	Very long	Frequent	
		June	16-36	>72	---	---	None	
		July	24-48	>72	---	---	None	
		August	24-52	>72	---	---	None	
		September	24-52	>72	---	---	None	
		October	20-44	>72	---	---	None	
		November	8-20	>72	---	---	None	
		December	0-8	>72	6-20	Very long	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1005:								
Shalcar, drained	D							
		January	0-8	>72	2-10	Very long	Frequent	
		February	0-8	>72	2-10	Very long	Frequent	
		March	0-12	>72	2-10	Very long	Frequent	
		April	0-12	>72	---	---	None	
		May	16-24	>72	---	---	None	
		June	16-36	>72	---	---	None	
		July	32-60	>72	---	---	None	
		August	48-72	>72	---	---	None	
		September	56-72	>72	---	---	None	
		October	48-60	>72	---	---	None	
		November	16-24	>72	---	---	None	
		December	0-8	>72	2-10	Very long	Frequent	
Semiahmoo	D							
		January	0-8	>72	6-20	Very long	Frequent	
		February	0-8	>72	6-20	Very long	Frequent	
		March	0-12	>72	6-20	Very long	Frequent	
		April	0-12	>72	6-20	Very long	Frequent	
		May	0-12	>72	4-10	Very long	Frequent	
		June	16-36	>72	---	---	None	
		July	24-48	>72	---	---	None	
		August	24-52	>72	---	---	None	
		September	24-52	>72	---	---	None	
		October	20-44	>72	---	---	None	
		November	8-20	>72	---	---	None	
		December	0-8	>72	6-20	Very long	Frequent	
1006:								
Semiahmoo	D							
		January	0-8	>72	6-20	Very long	Frequent	
		February	0-8	>72	6-20	Very long	Frequent	
		March	0-12	>72	6-20	Very long	Frequent	
		April	0-12	>72	6-20	Very long	Frequent	
		May	0-12	>72	4-10	Very long	Frequent	
		June	16-36	>72	---	---	None	
		July	24-48	>72	---	---	None	
		August	24-52	>72	---	---	None	
		September	24-52	>72	---	---	None	
		October	20-44	>72	---	---	None	
		November	8-20	>72	---	---	None	
		December	0-8	>72	6-20	Very long	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1006:								
Semiahmoo, drained	D							
		January	0-8	>72	2-10	Very long	Frequent	
		February	0-8	>72	2-10	Very long	Frequent	
		March	0-12	>72	2-10	Very long	Frequent	
		April	0-12	>72	---	---	None	
		May	16-24	>72	---	---	None	
		June	16-36	>72	---	---	None	
		July	32-60	>72	---	---	None	
		August	48-72	>72	---	---	None	
		September	56-72	>72	---	---	None	
		October	48-60	>72	---	---	None	
		November	16-24	>72	---	---	None	
		December	0-8	>72	2-10	Very long	Frequent	
Shalcar	D							
		January	0-8	>72	6-20	Very long	Frequent	
		February	0-8	>72	6-20	Very long	Frequent	
		March	0-12	>72	6-20	Very long	Frequent	
		April	0-12	>72	6-20	Very long	Frequent	
		May	0-12	>72	4-10	Very long	Frequent	
		June	16-36	>72	---	---	None	
		July	24-48	>72	---	---	None	
		August	24-52	>72	---	---	None	
		September	24-52	>72	---	---	None	
		October	20-44	>72	---	---	None	
		November	8-20	>72	---	---	None	
		December	0-8	>72	6-20	Very long	Frequent	
1016:								
Orcas	D							
		January	0	>72	6-20	Very long	Frequent	
		February	0-4	>72	6-20	Very long	Frequent	
		March	0-4	>72	6-20	Very long	Frequent	
		April	0-4	>72	6-20	Very long	Frequent	
		May	0-4	>72	1-6	Very long	Frequent	
		June	0-4	>72	1-6	Very long	Frequent	
		July	0-8	>72	1-3	Very long	Frequent	
		August	0-8	>72	1-3	Very long	Frequent	
		September	0-8	>72	1-3	Very long	Frequent	
		October	0-4	>72	1-6	Very long	Frequent	
		November	0-4	>72	6-20	Very long	Frequent	
		December	0-4	>72	6-20	Very long	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1017:								
Zylstra	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
Frostad	D							
		January	0-8	20-40	2-8	Very long	Frequent	
		February	0-8	20-40	2-8	Very long	Frequent	
		March	0-12	20-40	2-8	Very long	Frequent	
		April	0-12	20-40	---	---	None	
		May	16-24	20-40	---	---	None	
		June	16-36	20-40	---	---	None	
		November	16-24	20-40	---	---	None	
		December	0-8	20-40	2-8	Very long	Frequent	
Frostad, drained	D							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	4-16	20-40	---	---	None	
		April	4-16	20-40	---	---	None	
		May	16-24	20-40	---	---	None	
		June	16-36	20-40	---	---	None	
		November	16-24	20-40	---	---	None	
		December	4-12	20-40	---	---	None	
1018:								
Coupeville	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Mitchellbay, cool	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Du
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	
			In	*In*	*In*			
1018:								
Coupeville, drained----------------------	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-48	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	4-12	40-60	---	---	None	
1019:								
Morancreek, cool-------------------------	C							
		January	16-28	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
Limepoint--------------------------------	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Shalcar----------------------------------	D							
		January	0-8	>72	6-20	Very long	Frequent	
		February	0-8	>72	6-20	Very long	Frequent	
		March	0-12	>72	6-20	Very long	Frequent	
		April	0-12	>72	6-20	Very long	Frequent	
		May	0-12	>72	4-10	Very long	Frequent	
		June	16-36	>72	---	---	None	
		July	24-48	>72	---	---	None	
		August	24-52	>72	---	---	None	
		September	24-52	>72	---	---	None	
		October	20-44	>72	---	---	None	
		November	8-20	>72	---	---	None	
		December	0-8	>72	6-20	Very long	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Du
			In	*In*	*In*			
1020:								
Sholander, cool	C							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	
Limepoint	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Shalcar	D							
		January	0-8	>72	6-20	Very long	Frequent	
		February	0-8	>72	6-20	Very long	Frequent	
		March	0-12	>72	6-20	Very long	Frequent	
		April	0-12	>72	6-20	Very long	Frequent	
		May	0-12	>72	4-10	Very long	Frequent	
		June	16-36	>72	---	---	None	
		July	24-48	>72	---	---	None	
		August	24-52	>72	---	---	None	
		September	24-52	>72	---	---	None	
		October	20-44	>72	---	---	None	
		November	8-20	>72	---	---	None	
		December	0-8	>72	6-20	Very long	Frequent	
1021:								
Sholander, cool	C							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1021:								
Spieden	D							
		January	0-8	>72	2-8	Very long	Frequent	
		February	0-8	>72	2-8	Very long	Frequent	
		March	0-8	>72	2-8	Very long	Frequent	
		April	0-12	>72	---	---	None	
		May	16-28	>72	---	---	None	
		June	16-60	>72	---	---	None	
		November	16-52	>72	---	---	None	
		December	0-8	>72	2-8	Very long	Frequent	
Spieden, drained	D							
		January	4-12	>72	---	---	None	
		February	4-12	>72	---	---	None	
		March	4-12	>72	---	---	None	
		April	8-16	>72	---	---	None	
		May	16-28	>72	---	---	None	
		June	16-60	>72	---	---	None	
		November	16-52	>72	---	---	None	
		December	4-12	>72	---	---	None	
Sucia, cool	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-28	20-40	---	---	None	
		December	16-28	20-40	---	---	None	
1022:								
Coveland, cool	D							
		January	0-8	40-60	1-3	Brief	Frequent	
		February	0-8	40-60	1-3	Brief	Frequent	
		March	0-12	40-60	---	---	None	
		April	4-12	40-60	---	---	None	
		May	16-28	40-60	---	---	None	
		November	24-48	40-60	---	---	None	
		December	0-8	40-60	1-3	Brief	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	In	In			
1022:								
Coveland, cool, drained	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	
Coupeville	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Sucia, cool	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-28	20-40	---	---	None	
		December	16-28	20-40	---	---	None	
1023:								
Coupeville	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1023:								
Coupeville, drained	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-48	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	4-12	40-60	---	---	None	
Coveland, cool	D							
		January	0-8	40-60	1-3	Brief	Frequent	
		February	0-8	40-60	1-3	Brief	Frequent	
		March	0-12	40-60	---	---	None	
		April	4-12	40-60	---	---	None	
		May	16-28	40-60	---	---	None	
		November	24-48	40-60	---	---	None	
		December	0-8	40-60	1-3	Brief	Frequent	
1024:								
Limepoint	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Sholander, cool	C							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Du
			In	*In*	*In*			
1024:								
Limepoint, drained	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-48	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	4-12	40-60	---	---	None	
Shalcar	D							
		January	0-8	>72	6-20	Very long	Frequent	
		February	0-8	>72	6-20	Very long	Frequent	
		March	0-12	>72	6-20	Very long	Frequent	
		April	0-12	>72	6-20	Very long	Frequent	
		May	0-12	>72	4-10	Very long	Frequent	
		June	16-36	>72	---	---	None	
		July	24-48	>72	---	---	None	
		August	24-52	>72	---	---	None	
		September	24-52	>72	---	---	None	
		October	20-44	>72	---	---	None	
		November	8-20	>72	---	---	None	
		December	0-8	>72	6-20	Very long	Frequent	
1025:								
Beaches	D							
		January	0	>72	---	---	None	Ver
		February	0	>72	---	---	None	Ver
		March	0	>72	---	---	None	Ver
		April	0	>72	---	---	None	Ver
		May	0	>72	---	---	None	Ver
		June	0	>72	---	---	None	Ver
		July	0	>72	---	---	None	Ver
		August	0	>72	---	---	None	Ver
		September	0	>72	---	---	None	Ver
		October	0	>72	---	---	None	Ver
		November	0	>72	---	---	None	Ver
		December	0	>72	---	---	None	Ver

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1025:								
Endoaquents, tidal	D							
		January	0	>72	---	---	None	Ver
		February	0	>72	---	---	None	Ver
		March	0	>72	---	---	None	Ver
		April	0	>72	---	---	None	Ver
		May	0	>72	---	---	None	Ver
		June	0	>72	---	---	None	Ver
		July	0	>72	---	---	None	Ver
		August	0	>72	---	---	None	Ver
		September	0	>72	---	---	None	Ver
		October	0	>72	---	---	None	Ver
		November	0	>72	---	---	None	Ver
		December	0	>72	---	---	None	Ver
Xerorthents	A							
		Jan-Dec	---	---	---	---	None	
1026:								
Coveland, prairie	D							
		January	0-8	40-60	1-3	Brief	Frequent	
		February	0-8	40-60	1-3	Brief	Frequent	
		March	0-12	40-60	---	---	None	
		April	4-12	40-60	---	---	None	
		May	16-28	40-60	---	---	None	
		November	24-48	40-60	---	---	None	
		December	0-8	40-60	1-3	Brief	Frequent	
Coveland, prairie, drained	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	
Coupeville, prairie	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	In	In			
1026:								
Sucia, prairie	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-28	20-40	---	---	None	
		December	16-28	20-40	---	---	None	
1027:								
Coupeville, prairie	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Coupeville, prairie, drained	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-48	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	4-12	40-60	---	---	None	
Coveland, prairie	D							
		January	0-8	40-60	1-3	Brief	Frequent	
		February	0-8	40-60	1-3	Brief	Frequent	
		March	0-12	40-60	---	---	None	
		April	4-12	40-60	---	---	None	
		May	16-28	40-60	---	---	None	
		November	24-48	40-60	---	---	None	
		December	0-8	40-60	1-3	Brief	Frequent	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Du
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	
			In	*In*	*In*			
1028:								
Orcas, drained	D							
		January	0-8	>72	2-10	Very long	Frequent	
		February	0-8	>72	2-10	Very long	Frequent	
		March	0-12	>72	2-10	Very long	Frequent	
		April	0-12	>72	---	---	---	
		May	16-24	>72	---	---	---	
		June	16-36	>72	---	---	---	
		July	32-60	>72	---	---	---	
		August	48-72	>72	---	---	---	
		September	56-72	>72	---	---	---	
		October	48-60	>72	---	---	---	
		November	16-24	>72	---	---	---	
		December	0-8	>72	2-10	Very long	Frequent	
1051:								
Coupeville, prairie	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Ebeys	C							
		January	16-32	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
Coupeville, prairie, drained	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-48	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	4-12	40-60	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	In	In			
1052:								
Ebeys	C							
		January	16-32	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
Coupeville, prairie	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Coupeville, prairie, drained	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-48	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	4-12	40-60	---	---	None	
1053:								
Dugualla	D							
		January	0	>72	---	---	None	Ver
		February	0	>72	---	---	None	Ver
		March	0	>72	---	---	None	Ver
		April	0	>72	---	---	None	Ver
		May	0	>72	---	---	None	Ver
		June	0	>72	---	---	None	Ver
		July	0	>72	---	---	None	Ver
		August	0	>72	---	---	None	Ver
		September	0	>72	---	---	None	Ver
		October	0	>72	---	---	None	Ver
		November	0	>72	---	---	None	Ver
		December	0	>72	---	---	None	Ver

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1053:								
Dugualla, protected	D							
		January	0	>72	4-24	Very long	Frequent	
		February	0	>72	4-24	Very long	Frequent	
		March	0	>72	4-24	Very long	Frequent	
		April	0	>72	2-10	Very long	Frequent	
		May	0	>72	2-6	Very long	Frequent	
		June	0-4	>72	2-6	Very long	Frequent	
		July	12-20	>72	---	---	None	
		August	12-20	>72	---	---	None	
		September	12-20	>72	---	---	None	
		October	0-8	>72	2-10	Very long	Frequent	
		November	0	>72	2-10	Very long	Frequent	
		December	0	>72	4-24	Very long	Frequent	
Endoaquents, tidal	D							
		January	0	>72	---	---	None	Very
		February	0	>72	---	---	None	Very
		March	0	>72	---	---	None	Very
		April	0	>72	---	---	None	Very
		May	0	>72	---	---	None	Very
		June	0	>72	---	---	None	Very
		July	0	>72	---	---	None	Very
		August	0	>72	---	---	None	Very
		September	0	>72	---	---	None	Very
		October	0	>72	---	---	None	Very
		November	0	>72	---	---	None	Very
		December	0	>72	---	---	None	Very
1054:								
Puget, drained	C							
		January	0-8	>72	---	---	None	
		February	0-8	>72	---	---	None	
		March	0-12	>72	---	---	None	
		April	0-12	>72	---	---	None	
		May	16-24	>72	---	---	None	
		June	16-36	>72	---	---	None	
		July	32-56	>72	---	---	None	
		August	36-72	>72	---	---	None	
		September	41-72	>72	---	---	None	
		October	36-60	>72	---	---	None	
		November	16-24	>72	---	---	None	
		December	0-8	>72	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	In	In			
1054:								
Endoaquents, tidal	D							
		January	0	>72	---	---	None	Ver
		February	0	>72	---	---	None	Ver
		March	0	>72	---	---	None	Ver
		April	0	>72	---	---	None	Ver
		May	0	>72	---	---	None	Ver
		June	0	>72	---	---	None	Ver
		July	0	>72	---	---	None	Ver
		August	0	>72	---	---	None	Ver
		September	0	>72	---	---	None	Ver
		October	0	>72	---	---	None	Ver
		November	0	>72	---	---	None	Ver
		December	0	>72	---	---	None	Ver
Xerorthents	A							
		Jan-Dec	---	---	---	---	None	
1055:								
Urban land	D							
		Jan-Dec	---	---	---	---	None	
Coupeville	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
Coveland	D							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	
Hoypus	A							
		Jan-Dec	---	---	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
1055:								
Whidbey	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
2000:								
Whidbey	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
Hoypus	A							
		Jan-Dec	---	---	---	---	None	
2010:								
Whidbey	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
Hoypus	A							
		Jan-Dec	---	---	---	---	None	
2012:								
Elwha	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
Zylstra	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	In	In			
2012:								
Morancreek, cool	C							
		January	16-28	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
Everett	A							
		Jan-Dec	---	---	---	---	None	
2013:								
Zylstra	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
Frostad	D							
		January	0-8	20-40	2-8	Very long	Frequent	
		February	0-8	20-40	2-8	Very long	Frequent	
		March	0-12	20-40	2-8	Very long	Frequent	
		April	0-12	20-40	---	---	None	
		May	16-24	20-40	---	---	None	
		June	16-36	20-40	---	---	None	
		November	16-24	20-40	---	---	None	
		December	0-8	20-40	2-8	Very long	Frequent	
Elwha	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
2016:								
Zylstra	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
2016:								
Alderwood	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
Everett	A							
		Jan-Dec	---	---	---	---	None	
Frostad	D							
		January	0-8	20-40	2-8	Very long	Frequent	
		February	0-8	20-40	2-8	Very long	Frequent	
		March	0-12	20-40	2-8	Very long	Frequent	
		April	0-12	20-40	---	---	None	
		May	16-24	20-40	---	---	None	
		June	16-36	20-40	---	---	None	
		November	16-24	20-40	---	---	None	
		December	0-8	20-40	2-8	Very long	Frequent	
2017:								
Bozarth	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
Pilepoint	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-28	20-40	---	---	None	
		December	16-28	20-40	---	---	None	
2018:								
Sucia, cool	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-28	20-40	---	---	None	
		December	16-28	20-40	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Du
			In	*In*	*In*			
2018:								
Sholander, cool	C							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	
2019:								
Mitchellbay, cool	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
Coupeville	D							
		January	0-8	40-60	1-3	Brief	Frequent	
		February	0-8	40-60	1-3	Brief	Frequent	
		March	0-12	40-60	1-3	Brief	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	1-3	Brief	Frequent	
2023:								
Sucia, cool	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-28	20-40	---	---	None	
		December	16-28	20-40	---	---	None	
Sholander, cool	C							
		January	4-12	40-60	---	---	None	
		February	4-12	40-60	---	---	None	
		March	4-16	40-60	---	---	None	
		April	8-16	40-60	---	---	None	
		May	16-48	40-60	---	---	None	
		December	8-16	40-60	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
2023:								
Spieden	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
2024:								
Indianola	A							
		Jan-Dec	---	---	---	---	None	
Uselessbay	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-32	20-40	---	---	None	
		December	16-36	20-40	---	---	None	
Utsalady	A							
		January	36-48	>72	---	---	None	
		February	36-48	52-72	---	---	None	
		March	40-52	>72	---	---	None	
		December	40-68	>72	---	---	None	
2025:								
Utsalady	A							
		January	36-48	>72	---	---	None	
		February	36-48	52-72	---	---	None	
		March	40-52	>72	---	---	None	
		December	40-68	>72	---	---	None	
Uselessbay	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-32	20-40	---	---	None	
		December	16-36	20-40	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
2025:								
Spieden	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
2026:								
Uselessbay	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-32	20-40	---	---	None	
		December	16-36	20-40	---	---	None	
Utsalady	A							
		January	36-48	>72	---	---	None	
		February	36-48	52-72	---	---	None	
		March	40-52	>72	---	---	None	
		December	40-68	>72	---	---	None	
Spieden	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
2027:								
Utsalady	A							
		January	36-48	>72	---	---	None	
		February	36-48	52-72	---	---	None	
		March	40-52	>72	---	---	None	
		December	40-68	>72	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
2027:								
Uselessbay	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-32	20-40	---	---	None	
		December	16-36	20-40	---	---	None	
Spieden	D							
		January	0-8	40-60	2-8	Very long	Frequent	
		February	0-8	40-60	2-8	Very long	Frequent	
		March	0-12	40-60	2-8	Very long	Frequent	
		April	0-12	40-60	---	---	None	
		May	16-24	40-60	---	---	None	
		June	16-56	40-60	---	---	None	
		November	16-48	40-60	---	---	None	
		December	0-8	40-60	2-8	Very long	Frequent	
2052:								
Townsend	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
San Juan	A							
		Jan-Dec	---	---	---	---	None	
2054:								
Zylstra	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
Mitchellbay, cool	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
2055:								
Zylstra	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
Mitchellbay, cool	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
3001:								
Hoypus	A							
		Jan-Dec	---	---	---	---	None	
3003:								
Keystone	A							
		Jan-Dec	---	---	---	---	None	
Utsalady	A							
		January	36-48	>72	---	---	None	
		February	36-48	52-72	---	---	None	
		March	40-52	>72	---	---	None	
		December	40-68	>72	---	---	None	
Sucia, cool	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-28	20-40	---	---	None	
		December	16-28	20-40	---	---	None	
3005:								
San Juan	A							
		Jan-Dec	---	---	---	---	None	
3007:								
San Juan	A							
		Jan-Dec	---	---	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
3008:								
Xerorthents	A							
		Jan-Dec	---	---	---	---	None	
Endoaquents, tidal	D							
		January	0	>72	---	---	None	Ver
		February	0	>72	---	---	None	Ver
		March	0	>72	---	---	None	Ver
		April	0	>72	---	---	None	Ver
		May	0	>72	---	---	None	Ver
		June	0	>72	---	---	None	Ver
		July	0	>72	---	---	None	Ver
		August	0	>72	---	---	None	Ver
		September	0	>72	---	---	None	Ver
		October	0	>72	---	---	None	Ver
		November	0	>72	---	---	None	Ver
		December	0	>72	---	---	None	Ver
Beaches	D							
		January	0	>72	---	---	None	Ver
		February	0	>72	---	---	None	Ver
		March	0	>72	---	---	None	Ver
		April	0	>72	---	---	None	Ver
		May	0	>72	---	---	None	Ver
		June	0	>72	---	---	None	Ver
		July	0	>72	---	---	None	Ver
		August	0	>72	---	---	None	Ver
		September	0	>72	---	---	None	Ver
		October	0	>72	---	---	None	Ver
		November	0	>72	---	---	None	Ver
		December	0	>72	---	---	None	Ver
3011:								
Everett	A							
		Jan-Dec	---	---	---	---	None	
Alderwood	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
3017:								
Everett	A							
		Jan-Dec	---	---	---	---	None	
Alderwood	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
3018:								
Everett	A							
		Jan-Dec	---	---	---	---	None	
3019:								
Everett	A							
		Jan-Dec	---	---	---	---	None	
Alderwood	B							
		January	12-20	20-40	---	---	None	
		February	12-20	20-40	---	---	None	
		March	16-24	20-40	---	---	None	
		April	16-32	20-40	---	---	None	
		December	16-32	20-40	---	---	None	
Morancreek, cool	C							
		January	16-28	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
3020:								
Indianola	A							
		Jan-Dec	---	---	---	---	None	
3021:								
Indianola	A							
		Jan-Dec	---	---	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table Upper limit	Water table Lower limit	Ponding Surface water depth	Ponding Duration	Ponding Frequency	Du
			In	In	In			
3022:								
Aquic Dystroxerepts, coastal bluffs	B							
		January	16-28	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
Oxyaquic Xerorthents	B							
		January	16-28	40-60	---	---	None	
		February	16-28	52-60	---	---	None	
		March	20-32	40-60	---	---	None	
		April	24-44	40-60	---	---	None	
		December	24-44	40-60	---	---	None	
Beaches	D							
		January	0	>72	---	---	None	Ver
		February	0	>72	---	---	None	Ver
		March	0	>72	---	---	None	Ver
		April	0	>72	---	---	None	Ver
		May	0	>72	---	---	None	Ver
		June	0	>72	---	---	None	Ver
		July	0	>72	---	---	None	Ver
		August	0	>72	---	---	None	Ver
		September	0	>72	---	---	None	Ver
		October	0	>72	---	---	None	Ver
		November	0	>72	---	---	None	Ver
		December	0	>72	---	---	None	Ver
3024:								
Indianola	A							
		Jan-Dec	---	---	---	---	None	
3050:								
Hoypus	A							
		Jan-Dec	---	---	---	---	None	
3051:								
Snakelum	B							
		Jan-Dec	---	---	---	---	None	
San Juan	A							
		Jan-Dec	---	---	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
3052:								
Everett	A							
		Jan-Dec	---	---	---	---	None	
Hoypus	A							
		Jan-Dec	---	---	---	---	None	
Utsalady	A							
		January	36-48	>72	---	---	None	
		February	36-48	52-72	---	---	None	
		March	40-52	>72	---	---	None	
		December	40-68	>72	---	---	None	
3053:								
Bozarth	C							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
Ebeys	C							
		January	16-32	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
3054:								
Hoypus	A							
		Jan-Dec	---	---	---	---	None	
5000:								
Cady	D							
		Jan-Dec	---	---	---	---	None	
Rock outcrop	D							
		Jan-Dec	---	---	---	---	None	
Doebay	C							
		Jan-Dec	---	---	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table		Ponding			Du
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	
			In	*In*	*In*			
5000:								
Killebrew----------	D							
		January	4-12	20-40	---	---	None	
		February	4-12	20-40	---	---	None	
		March	8-16	20-40	---	---	None	
		April	12-20	20-40	---	---	None	
		December	8-16	20-40	---	---	None	
5001:								
Rock outcrop----------	D							
		Jan-Dec	---	---	---	---	None	
Haro----------	D							
		Jan-Dec	---	---	---	---	None	
Hiddenridge----------	B							
		Jan-Dec	---	---	---	---	None	
5003:								
Doebay----------	C							
		Jan-Dec	---	---	---	---	None	
Morancreek----------	C							
		January	16-28	>72	---	---	None	
		February	16-32	>72	---	---	None	
		March	20-52	>72	---	---	None	
		April	24-60	>72	---	---	None	
		December	24-40	>72	---	---	None	
Cady----------	D							
		Jan-Dec	---	---	---	---	None	
Rock outcrop----------	D							
		Jan-Dec	---	---	---	---	None	
5006:								
Cady----------	D							
		Jan-Dec	---	---	---	---	None	
Doebay----------	C							
		Jan-Dec	---	---	---	---	None	
Rock outcrop----------	D							
		Jan-Dec	---	---	---	---	None	

Table 13.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Du
			In	*In*	*In*			
5007:								
Haro	D							
		Jan-Dec	---	---	---	---	None	
Hiddenridge	B							
		Jan-Dec	---	---	---	---	None	
Rock outcrop	D							
		Jan-Dec	---	---	---	---	None	
5015:								
Doebay, moist	C							
		Jan-Dec	---	---	---	---	None	
Cady	D							
		Jan-Dec	---	---	---	---	None	
Rock outcrop	D							
		Jan-Dec	---	---	---	---	None	
Aquic Dystroxerepts, bedrock hills	D							
		January	4-12	40-60	---	---	None	Ver
		February	4-12	40-60	---	---	None	Ver
		March	4-16	40-60	---	---	None	Ver
		April	8-36	40-60	---	---	None	
		May	16-52	40-60	---	---	None	
		December	8-36	40-60	---	---	None	Ver

Soil Features

Table 14 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (K_{sat}), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Table 14.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a
data were not estimated.)

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	U
		In	In		In	In		
994:								
Urban land	---	---	---	---	0	---	---	
995:								
Water, miscellaneous	---	---	---	---	0	---	None	
996:								
Dumps	---	---	---	---	0	---	None	
997:								
Pits, gravel	---	---	---	---	0	---	None	
998:								
Water, saline	---	---	---	---	0	---	None	
999:								
Water, fresh	---	---	---	---	0	---	None	
1005:								
Shalcar	Strongly contrasting textural stratification	16-51	---	Noncemented	1-3	3-10	None	Hig
Shalcar, drained	Strongly contrasting textural stratification	16-51	---	Noncemented	6-10	16-51	None	Hig
Semiahmoo	---	---	---	---	1-3	3-10	None	Mod
1006:								
Semiahmoo	---	---	---	---	1-3	3-10	None	Mod
Semiahmoo, drained	---	---	---	---	1-3	3-10	None	Mod
Shalcar	Strongly contrasting textural stratification	16-51	---	Noncemented	1-3	3-10	None	Hig

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
1016:								
Orcas	---	---	---	---	1-3	3-10	None	Hig
1017:								
Zylstra	Dense material	20-40	---	Noncemented	0	---	None	Hig
Frostad	Dense material	20-40	---	Noncemented	0	---	None	Hig
Frostad, drained	Dense material	20-40	---	Noncemented	0	---	None	Hig
1018:								
Coupeville	Dense material	40-60	---	Noncemented	0	---	None	Hig
Mitchellbay, cool	Dense material	20-40	---	Noncemented	0	---	None	Mod
Coupeville, drained	Dense material	40-60	---	Noncemented	0	---	None	Hig
1019:								
Morancreek, cool	---	---	---	---	0	---	None	Low
Limepoint	Dense material	40-60	---	Noncemented	0	---	None	Hig
Shalcar	Strongly contrasting textural stratification	16-51	---	Noncemented	1-3	3-10	None	Hig
1020:								
Sholander, cool	Dense material	40-60	---	Noncemented	0	---	None	Low
Limepoint	Dense material	40-60	---	Noncemented	0	---	None	Hig
Shalcar	Strongly contrasting textural stratification	16-51	---	Noncemented	1-3	3-10	None	Hig
1021:								
Sholander, cool	Dense material	40-60	---	Noncemented	0	---	None	Low
Spieden	---	---	---	---	0	---	None	Mod
Spieden, drained	---	---	---	---	0	---	None	Mod
Sucia, cool	Dense material	20-40	---	Noncemented	0	---	None	Hig

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
1022:								
Coveland, cool	Dense material	40-60	---	Noncemented	0	---	None	Mod
Coveland, cool, drained	Dense material	40-60	---	Noncemented	0	---	None	Mod
Coupeville	Dense material	40-60	---	Noncemented	0	---	None	Hig
Sucia, cool	Dense material	20-40	---	Noncemented	0	---	None	Hig
1023:								
Coupeville	Dense material	40-60	---	Noncemented	0	---	None	Hig
Coupeville, drained	Dense material	40-60	---	Noncemented	0	---	None	Hig
Coveland, cool	Dense material	40-60	---	Noncemented	0	---	None	Mod
1024:								
Limepoint	Dense material	40-60	---	Noncemented	0	---	None	Hig
Sholander, cool	Dense material	40-60	---	Noncemented	0	---	None	Low
Limepoint, drained	Dense material	40-60	---	Noncemented	0	---	None	Hig
Shalcar	Strongly contrasting textural stratification	16-51	---	Noncemented	1-3	3-10	None	Hig
1025:								
Beaches	---	---	---	---	0	---	None	
Endoaquents, tidal	---	---	---	---	0	---	None	Hig
Xerorthents	---	---	---	---	0	---	None	Mod
1026:								
Coveland, prairie	Dense material	40-60	---	Noncemented	0	---	None	Mod
Coveland, prairie, drained	Dense material	40-60	---	Noncemented	0	---	None	Mod
Coupeville, prairie	Dense material	40-60	---	Noncemented	0	---	None	Hig
Sucia, prairie	Dense material	20-40	---	Noncemented	0	---	None	Hig

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
1027:								
Coupeville, prairie----	Dense material	40-60	---	Noncemented	0	---	None	Hig
Coupeville, prairie, drained---------------	Dense material	40-60	---	Noncemented	0	---	None	Hig
Coveland, prairie------	Dense material	40-60	---	Noncemented	0	---	None	Mod
1028:								
Orcas, drained---------	---	---	---	---	1-3	3-10	None	Hig
1051:								
Coupeville, prairie----	Dense material	40-60	---	Noncemented	0	---	None	Hig
Ebeys------------------	---	---	---	---	0	---	None	Mod
Coupeville, prairie, drained---------------	Dense material	40-60	---	Noncemented	0	---	None	Hig
1052:								
Ebeys------------------	---	---	---	---	0	---	None	Mod
Coupeville, prairie----	Dense material	40-60	---	Noncemented	0	---	None	Hig
Coupeville, prairie, drained---------------	Dense material	40-60	---	Noncemented	0	---	None	Hig
1053:								
Dugualla---------------	---	---	---	---	1-3	3-9	None	Hig
Dugualla, protected----	---	---	---	---	1-3	3-9	None	Hig
Endoaquents, tidal-----	---	---	---	---	0	---	None	Hig
1054:								
Puget, drained---------	---	---	---	---	0	---	None	Hig
Endoaquents, tidal-----	---	---	---	---	0	---	None	Hig
Xerorthents------------	---	---	---	---	0	---	None	Mod
1055:								
Urban land-------------	---	---	---	---	0	---	---	
Coupeville-------------	Dense material	40-60	---	Noncemented	0	---	None	Hig

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
1055:								
Coveland----------------	Dense material	40-60	---	Noncemented	0	---	None	Mod
Hoypus------------------	---	---	---	---	0	---	None	Low
Whidbey-----------------	Dense material	20-40	---	Noncemented	0	---	None	Low
2000:								
Whidbey-----------------	Dense material	20-40	---	Noncemented	0	---	None	Low
Hoypus------------------	---	---	---	---	0	---	None	Low
2010:								
Whidbey-----------------	Dense material	20-40	---	Noncemented	0	---	None	Low
Hoypus------------------	---	---	---	---	0	---	None	Low
2012:								
Elwha-------------------	Dense material	20-40	---	Noncemented	---	---	None	Mod
Zylstra-----------------	Dense material	20-40	---	Noncemented	---	---	None	Hig
Morancreek, cool--------	---	---	---	---	---	---	None	Low
Everett-----------------	---	---	---	---	0	---	None	Low
2013:								
Zylstra-----------------	Dense material	20-40	---	Noncemented	---	---	None	Hig
Frostad-----------------	Dense material	20-40	---	Noncemented	---	---	None	Hig
Elwha-------------------	Dense material	20-40	---	Noncemented	---	---	None	Mod
2016:								
Zylstra-----------------	Dense material	20-40	---	Noncemented	---	---	None	Hig
Alderwood---------------	Dense material	20-40	---	Noncemented	0	---	None	Low
Everett-----------------	---	---	---	---	0	---	None	Low
Frostad-----------------	Dense material	20-40	---	Noncemented	---	---	None	Hig

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
2017:								
Bozarth	Dense material	20-40	---	Noncemented	0	---	None	Mod
Pilepoint	Dense material	20-40	---	Noncemented	0	---	None	Mod
2018:								
Sucia, cool	Dense material	20-40	---	Noncemented	0	---	None	Hig
Sholander, cool	Dense material	40-60	---	Noncemented	0	---	None	Low
2019:								
Mitchellbay, cool	Dense material	20-40	---	Noncemented	0	---	None	Mod
Coupeville	Dense material	40-60	---	Noncemented	0	---	None	Hig
2023:								
Sucia, cool	Dense material	20-40	---	Noncemented	0	---	None	Hig
Sholander, cool	Dense material	40-60	---	Noncemented	0	---	None	Low
Spieden	---	---	---	---	0	---	None	Mod
2024:								
Indianola	---	---	---	---	0	---	None	Low
Uselessbay	Dense material	20-40	---	Noncemented	0	---	None	Low
Utsalady	---	---	---	---	0	---	None	Low
2025:								
Utsalady	---	---	---	---	0	---	None	Low
Uselessbay	Dense material	20-40	---	Noncemented	0	---	None	Low
Spieden	---	---	---	---	0	---	None	Mod
2026:								
Uselessbay	Dense material	20-40	---	Noncemented	0	---	None	Low
Utsalady	---	---	---	---	0	---	None	Low
Spieden	---	---	---	---	0	---	None	Mod

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
2027:								
Utsalady----------------	---	---	---	---	0	---	None	Low
Uselessbay--------------	Dense material	2-40	---	Noncemented	0	---	None	Low
Spieden-----------------	---	---	---	---	0	---	None	Mod
2052:								
Townsend----------------	Dense material	20-40	---	Noncemented	0	---	None	Mod
San Juan----------------	---	---	---	---	0	---	None	Low
2054:								
Zylstra-----------------	Dense material	20-40	---	Noncemented	0	---	None	Hig
Mitchellbay, cool-------	Dense material	20-40	---	Noncemented	0	---	None	Mod
2055:								
Zylstra-----------------	Dense material	20-40	---	Noncemented	0	---	None	Hig
Mitchellbay, cool-------	Dense material	20-40	---	Noncemented	0	---	None	Mod
3001:								
Hoypus------------------	---	---	---	---	0	---	None	Low
3003:								
Keystone----------------	---	---	---	---	0	---	None	Low
Utsalady----------------	---	---	---	---	0	---	None	Low
Sucia, cool-------------	Dense material	20-40	---	Noncemented	0	---	None	Hig
3005:								
San Juan----------------	---	---	---	---	0	---	None	Low
3007:								
San Juan----------------	---	---	---	---	0	---	None	Low
3008:								
Xerorthents-------------	---	---	---	---	0	---	None	Mod
Endoaquents, tidal------	---	---	---	---	0	---	None	Hig
Beaches-----------------	---	---	---	---	0	---	None	

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
3011:								
Everett	---	---	---	---	0	---	None	Low
Alderwood	Dense material	20-40	---	Noncemented	0	---	None	Low
3017:								
Everett	---	---	---	---	0	---	None	Low
Alderwood	Dense material	20-40	---	Noncemented	0	---	None	Low
3018:								
Everett	---	---	---	---	0	---	None	Low
3019:								
Everett	---	---	---	---	0	---	None	Low
Alderwood	Dense material	20-40	---	Noncemented	0	---	None	Low
Morancreek, cool	---	---	---	---	---	---	None	Low
3020:								
Indianola	---	---	---	---	0	---	None	Low
3021:								
Indianola	---	---	---	---	0	---	None	Low
3022:								
Aquic Dystroxerepts, coastal bluffs	---	---	---	---	---	---	None	Mod
Oxyaquic Xerorthents	Dense material	40-60	---	Noncemented	---	---	None	Low
Beaches	---	---	---	---	0	---	None	
3024:								
Indianola	---	---	---	---	0	---	None	Low
3050:								
Hoypus	---	---	---	---	0	---	None	Low
3051:								
Snakelum	---	---	---	---	0	---	None	Low
San Juan	---	---	---	---	0	---	None	Low

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Thickness	Restrictive layer: Hardness	Subsidence: Initial	Subsidence: Total	Potential for frost action	U
		In	*In*		*In*	*In*		
3052:								
Everett	---	---	---	---	0	---	None	Low
Hoypus	---	---	---	---	0	---	None	Low
Utsalady	---	---	---	---	0	---	None	Low
3053:								
Bozarth	Dense material	20-40	---	Noncemented	---	0	None	Mod
Ebeys	---	---	---	---	---	0	None	Mod
3054:								
Hoypus	---	---	---	---	0	---	None	Low
5000:								
Cady	Lithic bedrock	10-20	---	Indurated	0	---	None	Low
Rock outcrop	Lithic bedrock	0-0	---	Indurated	0	---	---	
Doebay	Lithic bedrock	20-40	---	Indurated	0	---	None	Low
Killebrew	Dense material	20-40	---	Noncemented	0	---	None	Hig
5001:								
Rock outcrop	Lithic bedrock	0-0	---	Indurated	0	---	---	
Haro	Lithic bedrock	10-20	---	Indurated	0	---	None	Low
Hiddenridge	Lithic bedrock	40-60	---	Indurated	0	---	None	Low
5003:								
Doebay	Lithic bedrock	20-40	---	Indurated	0	---	None	Low
Morancreek	---	---	---	---	0	---	None	Low
Cady	Lithic bedrock	10-20	---	Indurated	0	---	None	Low
Rock outcrop	Lithic bedrock	0-0	---	Indurated	0	---	---	
5006:								
Cady	Lithic bedrock	10-20	---	Indurated	0	---	None	Low
Doebay	Lithic bedrock	20-40	---	Indurated	0	---	None	Low
Rock outcrop	Lithic bedrock	0-0	---	Indurated	0	---	---	

Table 14.--Soil Features--Continued

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	U
	Kind	Depth to top	Thickness	Hardness	Initial	Total		
		In	*In*		*In*	*In*		
5007:								
Haro	Lithic bedrock	10-20	---	Indurated	0	---	None	Mod
Hiddenridge	Lithic bedrock	40-60	---	Indurated	0	---	None	Mod
Rock outcrop	Lithic bedrock	0-0	---	Indurated	0	---	---	
5015:								
Doebay, moist	Lithic bedrock	20-40	---	Indurated	0	---	None	Low
Cady	Lithic bedrock	10-20	---	Indurated	0	---	None	Low
Rock outcrop	Lithic bedrock	0-0	---	Indurated	0	---	---	
Aquic Dystroxerepts, bedrock hills	Lithic bedrock	40-60	---	Indurated	0	---	None	Mod

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2006). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Xeralf (*Xer*, meaning dry, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haploxeralfs (*Haplo*, meaning minimal horizonation, plus *xeralf*, the suborder of the Alfisols that has a xeric moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Aquultic* identifies the extragrade subgroup that has a seasonal high water table. An example is Aquultic Haploxeralfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is superactive, mesic Aquultic Haploxeralfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Table 15 indicates the order, suborder, great group, subgroup, and family of the taxonomic units in the county.

Table 15.--Taxonomic Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series.)

Soil name	Family or higher taxonomic class
*Alderwood	Loamy-skeletal, isotic, mesic Aquic Dystroxerepts
Aquic Dystroxerepts	Aquic Dystroxerepts
Bozarth	Coarse-loamy, mixed, superactive, mesic Aquultic Haploxerolls
Cady	Loamy, isotic, mesic Lithic Dystroxerepts
Coupeville	Fine-loamy, mixed, superactive, mesic Argiaquic Argialbolls
Coveland	Fine-loamy, mixed, superactive, mesic Aquic Haploxeralfs
Doebay	Loamy-skeletal, isotic, mesic Typic Dystroxerepts
Dugualla	Euic, mesic Halic Haplosaprists
Ebeys	Sandy, isotic, mesic Aquultic Haploxerolls
Elwha	Coarse-loamy, isotic, mesic Aquic Dystroxerepts
Endoaquents	Endoaquents
*Everett	Sandy-skeletal, isotic, mesic Typic Dystroxerepts
Frostad	Coarse-loamy, isotic, nonacid, mesic Aeric Epiaquepts
Haro	Loamy, isotic, mesic Lithic Ultic Haploxerolls
Hiddenridge	Loamy-skeletal, isotic, mesic Humic Dystroxerepts
Hoypus	Sandy-skeletal, isotic, mesic Typic Xerorthents
Indianola	Isotic, mesic Dystric Xeropsamments
Keystone	Isotic, mesic Dystric Xeropsamments
Killebrew	Fine-loamy, mixed, superactive, mesic Aquultic Haploxeralfs
Limepoint	Coarse-loamy, isotic, mesic Typic Epiaquolls
Mitchellbay	Fine-loamy, mixed, superactive, mesic Aquultic Haploxeralfs
Morancreek	Coarse-loamy, isotic, mesic Aquic Dystroxerepts
Orcas	Dysic, mesic Typic Sphagnofibrists
Oxyaquic Xerorthents	Oxyaquic Xerorthents
Pilepoint	Fine-loamy, mixed, superactive, mesic Xeric Argialbolls
Puget	Fine-silty, mixed, superactive, nonacid, mesic Fluvaquentic Endoaquepts
San Juan	Sandy, isotic, mesic Pachic Ultic Haploxerolls
Semiahmoo	Euic, mesic Typic Haplosaprists
Shalcar	Loamy, mixed, euic, mesic Terric Haplosaprists
Sholander	Sandy, isotic, mesic Aquic Dystroxerepts
Snakelum	Sandy, isotic, mesic Ultic Haploxerolls
Spieden	Sandy, isotic, mesic Typic Endoaquolls
Sucia	Fine-loamy, mixed, superactive, mesic Aquultic Haploxeralfs
Townsend	Loamy-skeletal, isotic, mesic Aquultic Haploxerolls
Uselessbay	Sandy, isotic, mesic Oxyaquic Dystroxerepts
Utsalady	Isotic, mesic Oxyaquic Xeropsamments
Whidbey	Loamy-skeletal, isotic, mesic Aquic Dystroxerepts
Xerorthents	Xerorthents
Zylstra	Coarse-loamy, isotic, mesic Aquic Dystroxerepts

Taxonomic Units and Their Morphology

In this section, each taxonomic unit recognized in the county is described. Characteristics of the soil and the material in which it formed are identified for each unit. A pedon, a small three-dimensional area of soil, that is typical of the unit in the county is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (Soil Survey Division Staff, 1993) and in the “Field Book for Describing and Sampling Soils” (Schoeneberger and others, 2002). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (Soil Survey Staff, 1999) and in “Keys to Soil Taxonomy” (Soil Survey Staff, 2006). Following the pedon description is the range of important characteristics of the soils in the taxonomic unit.

Alderwood Taxadjunct

Depth class: Moderately deep to dense material (fig. 17)
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 3 to 40 percent
Elevation: 0 to 590 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy-skeletal, isotic, mesic Aquic Dystroxerepts

Typical Pedon

Alderwood extremely gravelly sandy loam, taxadjunct, in the soil survey of San Juan County, Washington; 600 feet west and 1,650 feet south of the northeast corner of section 2, T. 36 N., R. 1 W.; Willamette Baseline Meridian; Mount Constitution, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 38 minutes 25 seconds north and longitude 122 degrees 47 minutes 23 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt wavy boundary.

A—1 to 10 inches; brown (10YR 4/3) extremely gravelly sandy loam, very dark brown (10YR 2/2) moist; weak very fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium and few coarse roots; common fine tubular and very fine irregular pores; 60 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

Bw—10 to 18 inches; yellowish brown (10YR 5/4) extremely gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, loose, nonsticky and nonplastic; many very fine, fine, and medium and few coarse roots; common fine tubular and very fine irregular pores; 50 percent gravel and 10 percent cobbles; slightly acid (pH 6.2); clear wavy boundary.

Bg—18 to 36 inches; brown (10YR 5/3) extremely gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; moderately hard, friable, nonsticky and nonplastic; common very fine and fine and few medium roots; common very fine irregular pores; 10 percent brownish yellow (10YR 6/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, and 20 percent light gray (2.5Y 7/1) iron depletions, dark grayish brown (2.5Y 4/2) moist; 50 percent gravel and 20 percent cobbles; moderately acid (pH 6.0); abrupt wavy boundary.

Figure 17.—Typical profile of an Alderwood soil. This soil has a high content of gravel and is moderately deep to a compact densic horizon. Numerals on tape indicate inches.

Cd—36 to 60 inches; pale red (2.5YR 7/2) gravelly silty clay loam, light olive brown (2.5Y 5/4) moist; massive; very hard, very firm, moderately sticky and very plastic; few fine roots in cracks; few very fine irregular pores; 5 percent light gray (2.5Y 7/1) iron depletions, dark grayish brown (2.5Y 4/2) moist, and 10 percent brownish yellow (10YR 6/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist; 20 percent gravel and 5 percent cobbles; moderately acid (pH 6.0).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Average annual soil temperature: 50 to 52 degrees F
Moisture control section: Dry 60 to 75 days following summer solstice
Depth to redoximorphic features: 18 to 36 inches
Reaction: Slightly acid or moderately acid
Particle-size control section: Clay content—5 to 15 percent; rock fragment content—35 to 85 percent total, including 35 to 60 percent gravel, 0 to 25 percent cobbles, and 0 to 5 percent stones

A horizon:
Hue—10YR or 7.5YR
Value—2 to 4 moist or dry
Chroma—2 or 3 moist or dry
Rock fragment content—15 to 80 percent total, including 15 to 80 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

Bw horizon:
Hue—10YR or 7.5YR
Value—3 to 5 moist or dry
Chroma—3 or 4 moist or dry
Texture—coarse sandy loam or sandy loam
Rock fragment content—35 to 80 percent total, including 35 to 65 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

Bg horizon:
Hue—10YR or 7.5YR
Value—3 to 5 moist or dry
Chroma—2 to 4 moist or dry
Texture—coarse sandy loam or sandy loam
Rock fragment content—35 to 90 percent total, including 35 to 60 percent gravel, 0 to 25 percent cobbles, and 0 to 5 percent stones

Cd horizon:
Hue—2.5YR, 10YR, or 2.5Y
Value—3 to 5 moist, 4 to 7 dry
Chroma—2 to 4 moist or dry
Texture—sandy loam, loam, or silt loam
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

Taxadjunct Feature

The Alderwood soils in this county are a taxadjunct to the Alderwood series because they are in the Aquic subgroup rather than the Vitrandic subgroup.

Aquic Dystroxerepts

Depth class: Deep or very deep to lithic bedrock
Drainage class: Somewhat poorly drained
Capacity to transmit water (K_{sat}): Moderately high to very high
Landscape: Hills, mountains
Landform: Drainageways

Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 1 to 15 percent
Elevation: 0 to 1,600 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Aquic Dystroxerepts

Typical Pedon

Aquic Dystroxerepts loamy sand in an area of Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes; 980 feet west and 920 feet north of the southeast corner of section 16, T. 33 N., R. 2 E.; Crescent Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 20 minutes 33 seconds north and longitude 122 degrees 33 minutes 13 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 4 inches; slightly decomposed plant material; very strongly acid (pH 4.5); clear wavy boundary.
Oe—4 to 7 inches; moderately decomposed plant material; very strongly acid (pH 4.5); clear irregular boundary.
Bw—7 to 17 inches; olive brown (2.5Y 4/3) loamy sand, dark olive brown (2.5Y 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine and very fine interstitial pores; moderately acid (pH 5.8); clear irregular boundary.
Bg1—17 to 41 inches; olive brown (2.5Y 4/3) silt loam, dark olive brown (2.5Y 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; common fine and very fine irregular pores; common coarse distinct irregular yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, that have diffuse boundaries throughout and common coarse distinct irregular light brownish gray (2.5Y 6/2) iron depletions, grayish brown (2.5Y 5/2) moist, that have diffuse boundaries throughout; moderately acid (pH 5.8); clear wavy boundary.
Bg2—41 to 55 inches; light olive brown (2.5Y 5/4) silt loam, olive brown (2.5Y 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many coarse distinct irregular light brownish gray (2.5Y 6/2) iron depletions, grayish brown (2.5Y 5/2) moist, that have diffuse boundaries throughout; moderately acid (pH 6.0); clear wavy boundary.
Cg—55 to 63 inches; light olive brown (2.5Y 5/4) fine sandy loam, olive brown (2.5Y 4/4) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common coarse distinct irregular yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, that have diffuse boundaries throughout; slightly acid (pH 6.4).

Range in Characteristics

Depth to restrictive feature: 40 to 60 inches or more
Mean annual soil temperature: 50 to 52 degrees F
Moisture control section: Dry 60 to 75 days following summer solstice
Depth to lithic contact: 40 to 60 inches or more; bedrock hill phase—40 to 60 inches and coastal bluff phase—more than 60 inches
Depth to redoximorphic features: 10 to 24 inches
Reaction: Slightly acid or moderately acid

Particle-size control section: Clay content—2 to 10 percent
Rock fragment content: 5 to 50 percent total, including 5 to 40 percent gravel and 0 to 20 percent cobbles

Bw horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist or dry
Chroma—3 or 4 moist or dry
Texture—sandy loam, loam, or loamy sand
Rock fragment content—5 to 50 percent total, including 5 to 40 percent gravel and 0 to 20 percent cobbles

Bg horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist or dry
Chroma—3 or 4 moist or dry
Texture—sandy loam, loamy fine sand, or silt loam
Rock fragment content—5 to 50 percent total, including 5 to 40 percent gravel and 0 to 20 percent cobbles

Cg horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist or dry
Chroma—3 or 4 moist or dry
Texture—silt loam, fine sandy loam, or loamy fine sand
Rock fragment content—5 to 50 percent total, including 5 to 40 percent gravel and 0 to 20 percent cobbles

Bozarth Series

Depth class: Moderately deep to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Eolian sand over dense glaciomarine deposits
Slope range: 0 to 8 percent
Elevation: 20 to 250 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Coarse-loamy, mixed, superactive, mesic Aquultic Haploxerolls

Typical Pedon

Bozarth sandy loam in an area of Bozarth-Ebeys complex, 0 to 12 percent slopes; 2,180 feet north and 2,420 feet west of the southeast corner of section 24, T. 32 N., R. 1 W.; Willamette Baseline Meridian; Port Townsend North, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 14 minutes 43 seconds north and longitude 122 degrees 45 minutes 22 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A1—0 to 10 inches; very dark gray (10YR 3/1) sandy loam, black (10YR 2/1) moist; weak medium granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine and few medium roots; clear wavy boundary.
A2—10 to 16 inches; very dark gray (10YR 3/1) fine sandy loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; moderately hard, very

friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent faint dark yellowish brown (10YR 4/6) iron-manganese masses, dark yellowish brown (10YR 3/6) moist, in matrix; clear wavy boundary.

A3—16 to 19 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; moderately hard, very friable, slightly sticky and slightly plastic; common very fine roots; 25 percent faint yellowish brown (10YR 5/4) iron-manganese masses, dark yellowish brown (10YR 4/4) moist, in matrix and 25 percent faint light brownish gray (2.5Y 6/2) iron depletions, grayish brown (2.5Y 5/2) moist, in matrix; clear irregular boundary.

E—19 to 23 inches; light gray (2.5Y 7/2) fine sandy loam, light brownish gray (2.5Y 6/2) moist; moderate medium subangular blocky structure; moderately hard, very friable, nonsticky and nonplastic; few very fine roots; 30 percent distinct light yellowish brown (10YR 6/4) iron-manganese masses, dark yellowish brown (10YR 4/4) moist, in matrix and 70 percent prominent light gray (2.5Y 7/2) iron depletions, light brownish gray (2.5Y 6/2) moist, in matrix; 5 percent gravel; clear wavy boundary.

2Bg—23 to 35 inches; brownish yellow (10YR 6/6) sandy loam, dark yellowish brown (10YR 4/6) moist; strong medium subangular blocky structure; very hard, very firm, slightly sticky and moderately plastic; few very fine roots in cracks; 15 percent prominent organoargillans that are black (10YR 2/1) moist and on faces of peds; 20 percent prominent brownish yellow (10YR 6/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, along root channels, 40 percent prominent brownish yellow (10YR 6/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, in matrix, and 30 percent distinct light gray (2.5Y 7/2) iron depletions, light brownish gray (2.5Y 6/2) moist, adjacent to pores; 5 percent gravel; clear wavy boundary.

2Cd—35 to 60 inches; very pale brown (10YR 7/3) silt loam, light olive brown (2.5Y 5/3) moist; massive; very hard, very firm, slightly sticky and moderately plastic; 5 percent distinct brownish yellow (10YR 6/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, in cracks; 5 percent gravel.

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Depth to redoximorphic features: 9 to 18 inches
Mollic epipedon thickness: 10 to 20 inches
Reaction: Moderately acid to neutral
Mean annual soil temperature: 50 to 52 degrees F
Particle-size control section: Clay content—2 to 17 percent; rock fragment content—0 to 15 percent gravel

A1 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—2 to 10 percent
Rock fragment content—0 to 5 percent gravel

A2 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—sandy loam, fine sandy loam, loam
Clay content—2 to 17 percent
Rock fragment content—0 to 5 percent gravel

A3 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—sandy loam or fine sandy loam
Clay content—2 to 17 percent
Rock fragment content—0 to 5 percent gravel

E horizon:
Hue—2.5Y or 10YR
Value—4 or 5 moist, 6 or 7 dry
Chroma—2 or 3 moist or dry
Texture—fine sandy loam or sandy loam
Clay content—2 to 17 percent
Rock fragment content—0 to 15 percent gravel

2Bg horizon:
Hue—10YR or 2.5Y
Value—3 or 4 moist, 5 to 7 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam or fine sandy loam
Clay content—2 to 17 percent
Rock fragment content—0 to 15 percent gravel

2Cd horizon:
Hue 10YR, 2.5Y, or 5Y
Value—4 or 5 moist, 5 to 7 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam, loam, or silt loam
Clay content—5 to 17 percent
Rock fragment content—0 to 20 percent gravel

Cady Series

Depth class: Shallow to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (K_{sat}): Moderately high or high
Landscape: Hills, mountains
Landform: Hillslopes, mountain slopes
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 5 to 75 percent
Elevation: 0 to 2,400 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy, isotic, mesic Lithic Dystroxerepts

Typical Pedon

Cady loam in an area of Cady-Rock outcrop complex, 5 to 30 percent slopes, in an area of forestland; 1,100 feet north and 1,500 feet east of the southwest corner of section 30, T. 36 N., R. 3 W.; Friday Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 34 minutes 57 seconds north and longitude 123 degrees 7 minutes 13 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt wavy boundary.
A—1 to 4 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine and medium roots; many very fine and fine irregular pores; 5 percent gravel; moderately acid (pH 5.7); clear wavy boundary.
Bw—4 to 16 inches; brownish yellow (10YR 6/6) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium, coarse, and very coarse roots; many very fine and fine irregular and common very fine and fine tubular pores; 10 percent gravel; moderately acid (pH 5.6); abrupt wavy boundary.
R—16 inches, metasedimentary rock.

Range in Characteristics

Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Average annual soil temperature: 49 to 54 degrees F
Soil moisture control section: Dry 60 to 90 days following summer solstice
Reaction: Moderately acid or slightly acid
Volcanic glass content: Less than 5 percent throughout
Particle-size control section: Texture—coarse sandy loam, fine sandy loam, sandy loam, or loam; clay content—5 to 15 percent; rock fragment content—0 to 35 percent gravel

A horizon:
Value—2 to 4 moist, 2 to 5 dry
Chroma—1 or 2 moist, 1 to 3 dry

Bw horizon:
Value—3 or 4 moist, 5 or 6 dry
Chroma—3 or 4 moist, 3 to 6 dry

Coupeville Series

Depth class: Deep to dense material
Drainage class: Poorly drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Valleys
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Elevation: 0 to 310 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Fine-loamy, mixed, superactive, mesic Argiaquic Argialbolls

Typical Pedon

Coupeville loam, prairie, 0 to 3 percent slopes; 1,100 feet north and 600 feet west of the southeast corner of section 4, T. 31 N., R. 1 E.; Willamette Baseline Meridian; Coupeville, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 11 minutes 55 seconds north and longitude 122 degrees 40 minutes 59 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Ap—0 to 7 inches; black (10YR 2/1) loam, dark gray (10YR 4/1) dry; moderate coarse granular structure; slightly hard, very friable, nonsticky and slightly plastic;

common very fine, fine, and medium roots; many very fine and fine interstitial pores; moderately acid (pH 5.6); clear wavy boundary.

A—7 to 12 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; 5 percent fine distinct yellowish brown (10YR 5/6) iron-manganese masses, yellow (10YR 7/6) dry, throughout and 5 percent fine faint grayish brown (2.5Y 5/2) iron depletions, light gray (2.5Y 7/2) dry, throughout; slightly acid (pH 6.5); abrupt wavy boundary.

2E—12 to 20 inches; grayish brown (2.5Y 5/2) clay loam, light gray (2.5Y 7/2) dry; strong medium angular blocky structure; moderately hard, friable, very sticky and very plastic; few very fine and fine roots; few fine interstitial pores; 30 percent fine distinct yellowish brown (10YR 5/6) iron-manganese masses, yellow (10YR 7/6) dry, throughout and 60 percent fine faint grayish brown (2.5Y 5/2) iron depletions, light gray (2.5Y 7/2) dry, throughout; neutral (pH 6.7); gradual wavy boundary.

2Btg1—20 to 34 inches; dark gray (2.5Y 4/1) clay loam, gray (2.5Y 6/1) dry; strong coarse angular blocky structure; hard, firm, very sticky and very plastic; few very fine and fine roots between peds; many fine tubular and common fine irregular pores; 40 percent fine faint grayish brown (2.5Y 5/2) iron depletions, light gray (2.5Y 7/2) dry, throughout and 40 percent fine distinct dark yellowish brown (10YR 4/6) iron-manganese masses, yellowish brown (10YR 5/6) dry, on faces of peds; neutral (pH 6.8); gradual wavy boundary.

2Btg2—34 to 50 inches; dark grayish brown (2.5Y 4/2) clay loam, light brownish gray (2.5Y 6/2) dry; strong coarse angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine and fine roots between peds; common fine irregular and tubular pores; 10 percent fine faint grayish brown (2.5Y 5/2) iron depletions, light brownish gray (2.5Y 6/2) dry, throughout and 30 percent fine distinct yellowish brown (10YR 5/6) iron-manganese masses, yellow (10YR 7/6) dry, on faces of peds; neutral (pH 6.8); gradual irregular boundary.

2Cd—50 to 60 inches; dark grayish brown (2.5Y 4/2) silty clay loam, light brownish gray (2.5Y 6/2) dry; massive; very hard, very firm, moderately sticky and very plastic; few fine irregular pores; 5 percent fine prominent yellowish brown (10YR 5/6) iron-manganese masses, yellow (10YR 7/6) dry, in cracks; neutral (pH 7.3).

Range in Characteristics

Depth to restrictive feature: 40 to 60 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Mollic epipedon thickness: 10 to 14 inches
Depth to redoximorphic features: 5 to 8 inches
Reaction: Moderately acid to slightly alkaline
Particle-size control section: Rock fragment content—0 to 15 percent gravel; clay content—18 to 35 percent

Ap horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—10 to 20 percent
Rock fragment content—0 to 5 percent gravel

A horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—loam or silt loam

Clay content—10 to 20 percent
Rock fragment content—0 to 5 percent gravel

2E horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 5 or 6 dry
Chroma—1 or 2 moist or dry
Texture—loam or clay loam
Clay content—18 to 30 percent
Rock fragment content—0 to 15 percent gravel

2Btg horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 5 or 6 dry
Chroma—1 or 2 moist or dry
Texture—loam or clay loam
Clay content—18 to 32 percent
Rock fragment content—0 to 15 percent gravel

2Cd horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 5 or 6 dry
Chroma—1 or 2 moist or dry
Texture—silt loam or silty clay loam
Clay content—15 to 30 percent
Rock fragment content—0 to 15 percent gravel

Coveland Series

Depth class: Deep to dense material
Drainage class: Somewhat poorly drained (fig. 18)
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Valleys
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 5 percent
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Fine-loamy, mixed, superactive, mesic Aquic Haploxeralfs

Typical Pedon

Coveland loam in the soil survey of San Juan County, Washington; 1,400 feet south and 1,300 feet west of the northeast corner of section 3, T. 34 N., R. 3 W., Willamette Baseline Meridian; False Bay, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 28 minutes 26 seconds north and longitude 123 degrees 2 minutes 41 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loam, black (10YR 2/1) moist; weak coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; many very fine and fine interstitial pores; 5 percent gravel; slightly acid (pH 6.4); abrupt smooth boundary.
A2—4 to 9 inches; dark grayish brown (10YR 4/2) loam, black (10YR 2/1) moist; weak coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic;

Figure 18.—Typical profile of a Coveland soil. The soil is somewhat poorly drained as indicated by the yellow and brown stains at a depth of about 20 inches. A compact densic horizon is at a depth of about 44 inches.

many very fine and fine and common medium roots; many very fine and fine interstitial pores; 5 percent gravel; slightly acid (pH 6.5); abrupt smooth boundary.

E—9 to 20 inches; gray (10YR 6/1) sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky

and nonplastic; common very fine and fine roots; few fine interstitial pores; 10 percent medium prominent irregular yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with clear boundaries throughout; 5 percent gravel; neutral (pH 7.1); clear wavy boundary.

2Btg1—20 to 36 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; strong coarse prismatic structure and strong medium prismatic; moderately hard, friable, moderately sticky and moderately plastic; many very fine roots in cracks and few very fine roots throughout; common fine irregular and many fine tubular pores; 5 percent discontinuous faint clay films on surfaces along pores and 60 percent discontinuous prominent organic stains on vertical faces of peds; 40 percent medium prominent irregular yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with clear boundaries throughout; slightly alkaline (pH 7.4); gradual wavy boundary.

2Btg2—36 to 44 inches; light brownish gray (2.5Y 6/2) silt loam, olive brown (2.5Y 4/3) moist; strong coarse angular blocky structure; moderately hard, friable, moderately sticky and moderately plastic; many very fine roots in cracks and few very fine roots throughout; common fine tubular and irregular pores; 5 percent discontinuous faint clay films on surfaces along pores and 15 percent discontinuous prominent organic stains on vertical faces of peds; 20 percent medium prominent irregular yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 3/6) moist, with clear boundaries throughout; moderately alkaline (pH 8.0); gradual wavy boundary.

2Cd—44 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine irregular pores; 10 percent medium prominent irregular yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with clear boundaries throughout; moderately alkaline (pH 7.9).

Range in Characteristics

Depth to restrictive feature: 40 to 60 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Depth to redoximorphic features: 9 to 18 inches
Reaction: Slightly acid to moderately alkaline
Particle-size control section: Clay content—18 to 35 percent; rock fragment content—0 to 15 percent gravel

A1 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—7 to 18 percent

A2 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—loam, silt loam, or sandy loam
Clay content—10 to 25 percent
Rock fragment content—0 to 15 percent gravel

E horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 6 or 7 dry
Chroma—1 or 2 moist or dry
Texture—sandy loam, loamy sand, or loam

Clay content—2 to 19 percent
Rock fragment content—0 to 15 percent gravel

2Btg horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist, 5 to 7 dry
Chroma—2 or 3 moist or dry
Texture—silt loam, silty clay loam, or loam
Clay content—18 to 35 percent
Rock fragment content—0 to 15 percent gravel

2Cd horizon:
Hue—2.5Y or 5Y
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 or 3 moist or dry
Texture—silty clay loam, loam, or silt loam
Clay content—17 to 32 percent
Rock fragment content—0 to 15 percent gravel

Doebay Series

Depth class: Moderately deep to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (K_{sat}): Moderately high or high
Landscape: Hills, mountains
Landform: Hillslopes, mountain slopes
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 5 to 75 percent
Elevation: 0 to 2,400 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy-skeletal, isotic, mesic Typic Dystroxerepts

Typical Pedon

Doebay loam in the soil survey of San Juan County, Washington; 1,900 feet north and 2,100 feet east of the southeast corner of section 33; T. 37 N., R. 1 W.; Mount Constitution, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 39 minutes 1 second north and longitude 122 degrees 50 minutes 40 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt wavy boundary.
A—1 to 6 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; moderately hard, friable; common fine and medium and few coarse roots; common very fine and fine irregular and tubular pores; 10 percent gravel; moderately acid (pH 5.7); abrupt smooth boundary.
Bw1—6 to 16 inches; dark yellowish brown (10YR 4/6) fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable; many fine and medium and few coarse roots; common very fine and fine irregular and tubular pores; 10 percent gravel; moderately acid (pH 5.6); clear smooth boundary.
Bw2—16 to 21 inches; yellowish brown (10YR 5/6) very gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; soft, very friable; common fine and medium and few coarse roots; common very

fine and fine tubular and irregular pores; 35 percent gravel and 5 percent cobbles; moderately acid (pH 5.6); clear wavy boundary.

C—21 to 35 inches; light olive brown (2.5Y 5/4) extremely gravelly loam, olive brown (2.5Y 4/3) moist; weak medium subangular blocky structure; soft, very friable; common very fine and fine interstitial and irregular pores; 65 percent gravel; moderately acid (pH 5.6); abrupt wavy boundary.

R—35 inches; metasedimentary rock.

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Average annual soil temperature: 50 to 52 degrees F
Soil moisture control section: Dry 60 to 90 days following summer solstice
Reaction: Strongly acid or moderately acid
Volcanic glass content: 0 to less than 5 percent in A and Bw horizons
Particle-size control section: Clay content—5 to 18 percent; rock fragment content—35 to 75 percent total, including 35 to 75 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent stones

A horizon:
Value—2 or 3 moist, 4 or 5 dry
Chroma—2 or 3 moist, 3 or 4 dry
Texture—loam, fine sandy loam, or sandy loam
Clay content—5 to 18 percent
Rock fragment content—10 to 35 percent gravel

Bw1 horizon:
Hue—7.5YR or 10YR
Value—3 or 4 moist, 4 or 5 dry
Chroma—2 to 4 moist, 3 to 6 dry
Texture—loam, sandy loam, or fine sandy loam
Clay content—5 to 18 percent
Rock fragment content—0 to 35 percent total, including 10 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Bw2 horizon:
Hue—7.5YR to 2.5YR
Value—3 or 4 moist, 5 or 6 dry
Chroma—3 or 4 moist, 3 to 6 dry
Texture—loam, sandy loam, or fine sandy loam
Clay content—5 to 18 percent
Rock fragment content—35 to 60 percent total, including 35 to 60 percent gravel, 0 to 10 percent cobbles, and 0 to 10 percent stones

C horizon:
Hue—10YR to 2.5Y
Value—4 or 5 moist, 4 to 7 dry
Chroma—2 to 4 moist, 2 to 6 dry
Texture—loam, fine sandy loam, sandy loam, or coarse sandy loam
Clay content—2 to 12 percent
Rock fragment content—50 to 75 percent total, including 50 to 75 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Dugualla Series

Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained

Capacity to transmit water (K_{sat}): Moderately high or high
Landscape: Shore complexes
Landform: Depressions, lagoons
Parent material: Herbaceous organic deposits
Slope range: 0 to 2 percent
Elevation: 0 to 7 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Euic, mesic Halic Haplosaprists

Typical Pedon

Dugualla muck in the soil survey of San Juan County, Washington; 1,500 feet east and 1,850 feet north of the southwest corner of section 11, T. 34 N., R. 2 W. Willamette Baseline Meridian; Richardson, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 27 minutes 15 seconds north and longitude 122 degrees 54 minutes 13 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oa1—0 to 11 inches; black (10YR 2/1) muck, very dark gray (10YR 3/1) dry; about 20 percent fiber, 5 percent rubbed; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; many very fine tubular pores; 15 percent fine prominent very pale brown (10YR 7/4) iron depletions, very pale brown (10YR 8/2) dry, in matrix; slightly acid (pH 6.5); clear wavy boundary.

Oa2—11 to 20 inches; very dark brown (7.5YR 2.5/2) muck, brown (7.5YR 4/2) dry; about 10 percent fiber, 3 percent rubbed; strong thin platy structure; hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; 10 percent fine distinct irregular very pale brown (10YR 7/4) iron depletions, very pale brown (10YR 8/2) dry, in matrix and 15 percent fine distinct irregular dark yellowish brown (10YR 4/6) iron-manganese masses, yellowish brown (10YR 5/6) dry, on surfaces along root channels; slightly acid (pH 6.3); gradual wavy boundary.

Oa3—20 to 26 inches; very dark brown (10YR 2/2) muck, very dark gray (10YR 3/1) dry; about 20 percent fiber, 5 percent rubbed; moderate medium platy structure; moderately hard, very friable, nonsticky and nonplastic; few fine roots; many very fine irregular pores; 20 percent angular noncemented shell fragments; neutral (pH 7.1); gradual wavy boundary.

Oa4—26 to 60 inches; very dark brown (7.5YR 2.5/2) muck, brown (7.5YR 4/2) dry; about 5 percent fiber, 0 percent rubbed; massive; hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine irregular pores; neutral (pH 7.2).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Depth to mineral soil material: More than 51 inches
Reaction: Slightly acid or neutral
Electrical conductivity: More than 30 decisiemens per meter for 6 months or more throughout the upper 51 inches
Rubbed fiber content: Averages less than 16 percent throughout the upper 51 inches

Oa1 horizon:
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry

Oa2, Oa3, and Oa4 horizons:
Hue—7.5YR to 10YR
Value—2 to 3 moist, 2 to 4 dry
Chroma—1 to 3 moist or dry

Ebeys Series

Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Moderately high to very high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Eolian sand over sandy glaciomarine deposits
Slope range: 0 to 12 percent
Elevation: 0 to 250 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy, isotic, mesic Aquultic Haploxerolls

Typical Pedon

Ebeys loam (fig. 19) in an area of Coupeville-Ebeys complex, 0 to 5 percent slopes; 910 feet south and 50 feet west of the northeast corner of section 15, T. 31 N., R. 1 E.; Willamette Baseline Meridian; Coupeville, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 10 minutes 43 seconds north and longitude 122 degrees 39 minutes 34 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Ap—0 to 6 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak medium subangular blocky structure parting to weak coarse granular; slightly hard, very friable, nonsticky and slightly plastic; many very fine and fine and few medium and coarse roots; many very fine and fine and common medium dendritic tubular pores; moderately acid (pH 6.0); abrupt wavy boundary.

A—6 to 15 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate coarse subangular blocky structure; moderately hard, friable, slightly sticky and moderately plastic; common very fine and fine and few medium and coarse roots; common very fine, fine, and medium dendritic tubular pores; slightly acid (pH 6.1); abrupt wavy boundary.

Bw—15 to 23 inches; dark gray (10YR 4/1) sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine to coarse roots; common very fine and fine irregular pores; 5 percent fine distinct irregular brownish yellow (10YR 6/6) masses of oxidized iron, yellowish brown (10YR 5/6) moist, in matrix with clear boundaries; slightly acid (pH 6.1); clear irregular boundary.

Bg—23 to 34 inches; grayish brown (10YR 5/2) loamy sand, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; common very fine and fine irregular pores; 15 percent medium distinct irregular brownish yellow (10YR 6/6) masses of oxidized iron, yellowish brown (10YR 5/6) moist, in matrix with clear boundaries and 15 percent fine faint irregular light gray (10YR 7/2) iron depletions, grayish brown (10YR 5/2) moist, in matrix with clear boundaries; slightly acid (pH 6.4); clear wavy boundary.

Cg1—34 to 50 inches; grayish brown (10YR 5/2) loamy sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine

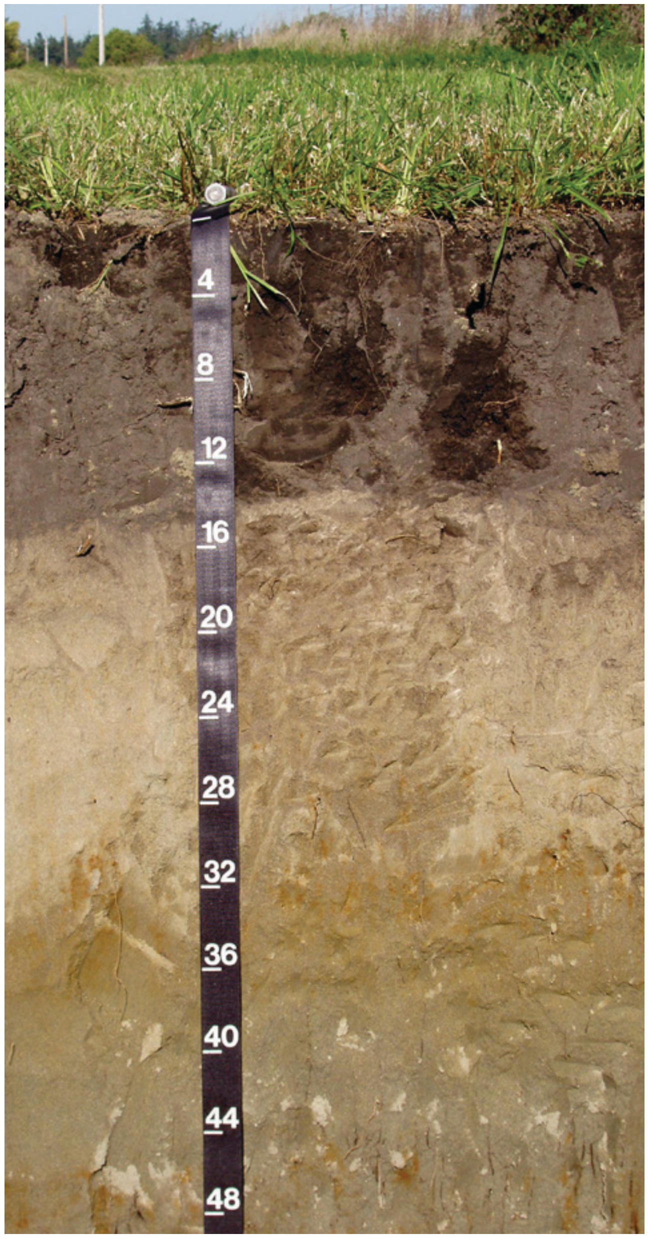

Figure 19.—Typical profile of an Ebeys soil. The soil is sandy and very deep. The thick, dark-colored surface horizon is the result of an accumulation of organic matter from the prairie grassland. Numerals on tape indicate inches.

and medium roots; common very fine irregular pores; 15 percent medium faint irregular light gray (10YR 7/2) iron depletions, grayish brown (10YR 5/2) moist, with clear boundaries in matrix and 40 percent medium distinct irregular brownish yellow (10YR 6/6) masses of oxidized iron, yellowish brown (10YR 5/6) moist, in matrix with clear boundaries; slightly acid (pH 6.4); diffuse irregular boundary.

Cg2—50 to 60 inches; grayish brown (2.5Y 5/2) fine sand, dark grayish brown (2.5Y 4/2) moist; massive; loose, nonsticky and nonplastic; few fine roots; common very fine irregular pores; 10 percent medium distinct irregular light gray (2.5Y 7/2) iron

depletions, grayish brown (2.5Y 5/2) moist, in matrix with clear boundaries, 10 percent medium distinct irregular yellowish brown (10YR 5/6) masses of oxidized iron, dark yellowish brown (10YR 4/6) moist, with clear boundaries adjacent to pores, and 50 percent medium distinct irregular yellowish brown (10YR 5/6) masses of oxidized iron, dark yellowish brown (10YR 4/6) moist, in matrix with clear boundaries; slightly acid (pH 6.4).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Depth to redoximorphic features: 19 to 40 inches
Mollic epipedon thickness: 10 to 20 inches
Reaction: Slightly acid or moderately acid
Mean annual soil temperature: 50 to 52 degrees F
Particle-size control section: Clay content—0 to 15 percent

A horizon:
Value—2 to 3 moist, 3 to 4 dry
Chroma—1 to 2 moist, 2 to 3 dry
Texture—loam or sandy loam
Clay content—5 to 15 percent

Bw horizon:
Hue—10YR to 7.5YR
Value—3 to 4 moist, 4 to 5 dry
Chroma—1 to 3 moist or dry
Texture—sandy loam or loamy sand
Clay content—2 to 10 percent

Bg horizon:
Hue—10YR to 7.5YR
Value—4 to 5 moist, 5 to 6 dry
Chroma—2 to 4 moist, 3 to 4 dry
Texture—loamy sand or fine sand
Clay content—0 to 5 percent

Cg horizon:
Hue—10YR to 2.5Y
Value—4 to 5 moist, 5 to 6 dry
Chroma—2 to 3 moist, 3 to 4 dry
Texture—loamy sand or fine sand
Clay content—0 to 5 percent

Elwha Series

Depth class: Moderately deep to dense material (fig. 20)
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 12 percent
Elevation: 0 to 590 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Coarse-loamy, isotic, mesic Aquic Dystroxerepts

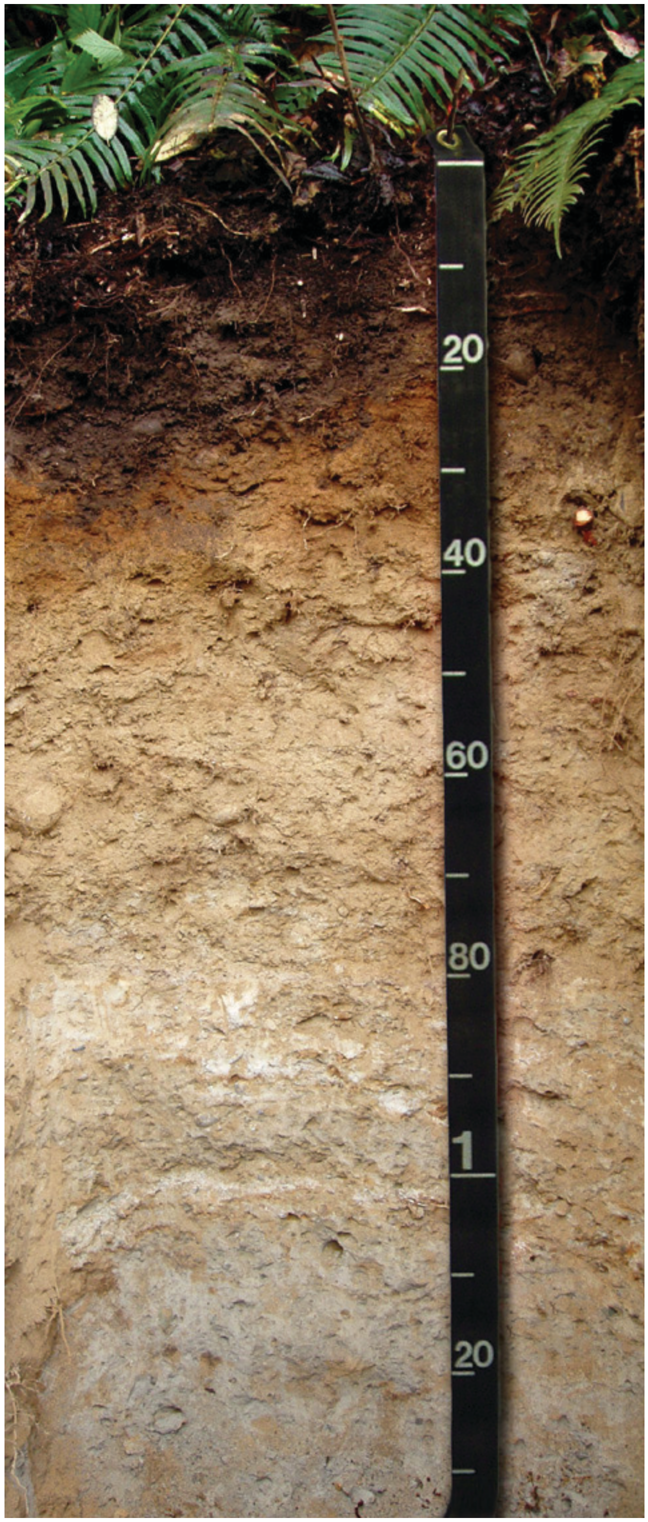

Figure 20.—Typical profile of an Elwha soil. The soil is moderately deep to a compact, dense horizon. This horizon is impermeable to water, and water accumulates above it. The dense horizon is at a depth of about 1 meter. The orange and red stains below a depth of 80 centimeters are the result of a periodic, stagnant water table.

Typical Pedon

Elwha gravelly sandy loam in the soil survey of Clallam County, Washington; 1,970 feet west and 984 feet south of the northeast corner of section 12, T. 29 N., R. 5 W. Willamette Baseline Meridian; Morse Creek, Washington, U.S. Geological Survey quadrangle; latitude 46 degrees 1 minute 34 seconds north and longitude 123 degrees 15 minutes 49 seconds west, NAD 83. (Colors are for moist soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt smooth boundary.

Oe—1 to 2 inches; moderately decomposed plant material; abrupt smooth boundary.

A—2 to 6 inches; dark brown (10YR 3/3) gravelly sandy loam, pale brown (10YR 6/3) dry; weak fine and very fine granular structure; soft, friable, nonsticky and nonplastic; many very fine and fine roots; many fine irregular and tubular pores; 15 percent gravel; strongly acid (pH 5.4); gradual smooth boundary.

Bw1—6 to 14 inches; brown (10YR 4/3) gravelly sandy loam, very pale brown (10YR 7/3) dry; weak very fine and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many fine irregular and tubular pores; 15 percent gravel and 5 percent cobbles; strongly acid (pH 5.4); gradual smooth boundary.

Bw2—14 to 26 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam, very pale brown (10YR 7/4) dry; weak fine and very fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; many fine irregular and tubular pores; 20 percent gravel and 5 percent cobbles; strongly acid (pH 5.4); clear smooth boundary.

Bg—26 to 35 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam, very pale brown (10YR 7/4) dry; weak medium and fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine irregular and tubular pores; many coarse distinct yellowish brown (10YR 5/6) iron-manganese masses, yellow (10YR 7/6) dry, and many coarse distinct light brownish gray (10YR 6/2) iron depletions, light gray (10YR 7/2) dry; 20 percent gravel and 5 percent cobbles; moderately acid (pH 5.6); clear smooth boundary.

2Cd1—35 to 44 inches; light yellowish brown (2.5Y 6/4) gravelly sandy loam, pale yellow (2.5Y 7/4) dry; massive; very hard, firm, slightly sticky and slightly plastic; few very fine roots in cracks; few fine irregular and tubular pores; common coarse distinct dark yellowish brown (10YR 4/6) iron-manganese masses, brownish yellow (10YR 6/6) dry; 15 percent gravel; slightly acid (pH 6.2); clear smooth boundary.

2Cd2—44 to 60 inches; grayish brown (2.5Y 5/2) gravelly sandy loam, light gray (2.5Y 7/2) dry; massive; very hard, firm, slightly sticky and slightly plastic; very few very fine roots in cracks; few fine irregular pores; few coarse distinct dark yellowish brown (10YR 4/6) iron-manganese masses, brownish yellow (10YR 6/6) dry; 15 percent gravel; neutral (pH 6.8).

Range in Characteristics

Depth to diagnostic horizons and features are from mineral soil surface.

Mean annual soil temperature: 50 to 52 degrees F
Moisture control section: Dry 60 to 75 days following summer solstice
Depth to densic contact: 40 to 60 inches
Depth to redoximorphic features: 18 to 40 inches
Reaction: Strongly acid to neutral
Volcanic glass content: Less than 5 percent in upper 30 inches
Acid-oxalate extractable Al and ½ iron: Less than 1 percent in upper 30 inches

Particle-size control section: Clay content—5 to 18 percent; rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

A horizon:
Value—3 or 4 moist, 5 to 7 dry
Chroma—3 or 4 moist or dry
Rock fragment content—15 to 35 percent gravel

Bw horizon:
Hue—10YR or 2.5Y
Value—4 to 6 moist, 6 to 8 dry
Chroma—2 to 4 moist or dry
Texture—loam, sandy loam, or coarse sandy loam
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

Bg horizon:
Value—4 or 5 moist, 6 or 7 dry
Chroma—3 or 4 moist or dry
Texture—sandy loam or coarse sandy loam
Rock fragment content—15 to 35 percent gravel

2Cd horizon:
Hue—2.5Y or 5Y
Value—4 to 6 moist, 7 or 8 dry
Texture—loam or sandy loam
Rock fragment content—0 to 35 percent gravel

Endoaquents

Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Capacity to transmit water (K_{sat}): Very high
Landscape: Shore complexes
Landform: Beaches
Parent material: Beach sand
Slope range: 0 to 5 percent
Elevation: 0 to 10 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Endoaquents

Typical Pedon

Endoaquents gravelly sand in the soil survey of San Juan County, Washington; 1,250 feet east and 1,700 feet north of the southwest corner of section 9, T. 36 N., R. 1 W.; Willamette Baseline Meridian; Blakely Island, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 37 minutes 18 seconds north and longitude 122 degrees 49 minutes 49 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

C1—0 to 29 inches; greenish black (5GY 2.5/0) gravelly sand; 20 percent black (N 2.5/0) mottles; single grain; loose, nonsticky and nonplastic; few tubular pores;

2 percent dark yellowish brown (10YR 4/4) iron-manganese masses; 15 percent gravel; strongly acid (pH 5.2) clear wavy boundary.

C2—29 to 48 inches; greenish black (5GY 2.5/1) very gravelly coarse sand; single grain; loose, nonsticky and nonplastic; common interstitial pores; 50 percent gravel; neutral (pH 7.1); gradual wavy boundary.

C3—48 to 60 inches; greenish black (5GY 2.5/1) extremely gravelly coarse sand; single grain; loose, nonsticky and nonplastic; common interstitial pores; 65 percent gravel; neutral (pH 7.2).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Reaction: Moderately acid to neutral
Clay content: 0 to 2 percent

C1 horizon:
Texture—fine sand, loamy coarse sand, or sand
Rock fragment content—0 to 35 percent gravel

C2 and C3 horizons:
Texture—sand or coarse sand
Rock fragment content—35 to 90 percent gravel

Everett Taxadjunct

Depth class: Very deep (more than 60 inches) (fig. 21)
Drainage class: Somewhat excessively drained
Capacity to transmit water (K_{sat}): High or very high
Landscape: Hills, drift plains
Landform: Hillslopes
Parent material: Glacial outwash
Slope range: 0 to 40 percent
Elevation: 0 to 590 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy-skeletal, isotic, mesic Typic Dystroxerepts

Typical Pedon

Everett sandy loam, taxadjunct, in the soil survey of San Juan County, Washington; 1,700 feet north and 10 feet west of the southeast corner of section 9, T. 36 N., R. 1 W.; Willamette Baseline Meridian; Blakely Island, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 37 minutes 16 seconds north and longitude 122 degrees 48 minutes 50 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 2 inches; slightly decomposed plant material; abrupt wavy boundary.

A—2 to 9 inches; brown (10YR 4/3) sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; common very fine and fine tubular and irregular pores; 10 percent gravel; very strongly acid (pH 4.7); abrupt wavy boundary.

Bw1—9 to 13 inches; yellowish brown (10YR 5/6) gravelly sandy loam, dark yellowish brown (10YR 3/6) moist; weak medium subangular blocky structure; slightly hard,

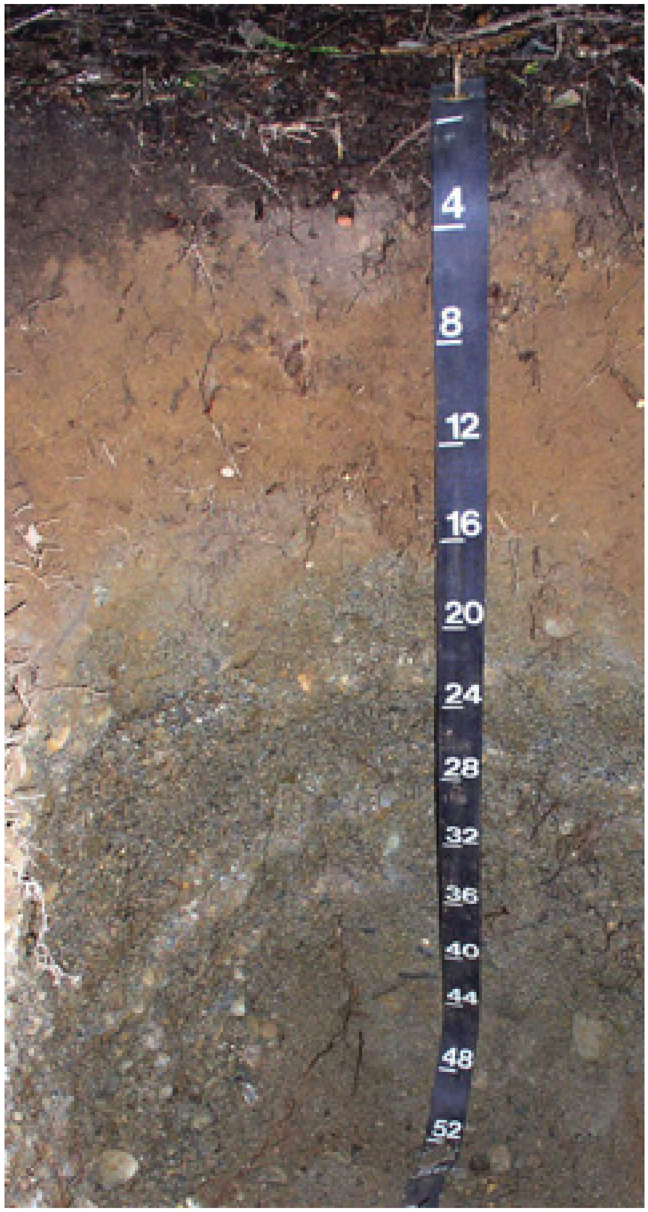

Figure 21.—Typical profile of an Everett soil. This soil is one of the most common in Island County. It is on hillslopes. It has a high content of gravel and is very deep. Numerals on tape indicate inches.

very friable, nonsticky and nonplastic; common fine and few medium roots; few very fine and fine irregular and tubular pores; 25 percent gravel; very strongly acid (pH 4.9); clear wavy boundary.

Bw2—13 to 30 inches; yellowish brown (10YR 5/6) very gravelly coarse sand, dark yellowish brown (10YR 3/6) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine and few medium and coarse roots; few very fine and fine irregular and common very fine and fine interstitial pores; 50 percent gravel; strongly acid (pH 5.4); gradual wavy boundary.

C—30 to 60 inches; variegated extremely gravelly coarse sand; single grain; loose, nonsticky and nonplastic; 65 percent gravel; moderately acid (pH 5.8).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Soil moisture control section: Dry for 60 to 75 consecutive days
Estimated volcanic glass content: Less than 5 percent
Estimated acid-oxalate extractable Al plus ½ iron: Less than 0.4 percent
Particle-size control section: Rock fragment content—35 to 75 percent total, including 35 to 75 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

A horizon:
Hue—10YR to 5YR
Value—2 to 5 moist, 4 to 6 dry
Chroma—1 to 3 moist or dry
Reaction—very strongly acid or strongly acid

Bw horizon:
Hue—10YR or 7.5YR
Value—3 to 6 moist, 3 to 6 dry
Chroma—2 to 6 moist or dry
Reaction—very strongly acid to moderately acid
Texture—sandy loam, loamy sand, loamy coarse sand, or coarse sand
Clay content—0 to 12 percent
Rock fragment content—5 to 75 percent total, including 35 to 60 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

C horizon:
Color—variegated parent material colors
Texture—coarse sand, loamy sand, or fine sand
Reaction—slightly acid or moderately acid
Clay content—0 to 2 percent
Rock fragment content—50 to 75 percent total, including 50 to 70 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

Taxadjunct Feature

The Everett soils in this county are a taxadjunct to the Everett series because they are in the Typic subgroup rather than the Vitrandic subgroup.

Frostad Series

Depth class: Moderately deep to dense material
Drainage class: Poorly drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Drainageways, valleys
Parent material: Glacial drift over dense glacial drift
Slope range: 0 to 3 percent
Elevation: 0 to 590 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Coarse-loamy, isotic, nonacid, mesic Aeric Epiaquepts

Typical pedon of Frostad loam in an area of Zylstra-Frostad complex, 0 to 3 percent slopes; about 800 feet east and 475 feet south of the northwest corner of section 21, T. 33 N, R. 2 E; Willamette Baseline Meridian; Crescent Harbor, Washington,

U.S. Geological Survey quadrangle; latitude 48 degrees 20 minutes 19 seconds north and longitude 122 degrees 34 minutes 8 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; clear wavy boundary.

A—1 to 7 inches; very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium and coarse roots; many very fine and fine irregular pores; 10 percent gravel; moderately acid (pH 5.8); clear wavy boundary.

Bg—7 to 16 inches; brown (10YR 4/3) sandy loam, brown (10YR 5/3) dry; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots in cracks; few very fine irregular pores; many coarse distinct dark yellowish brown (10YR 3/6) iron-manganese masses in cracks and many coarse distinct grayish brown (10YR 5/2) iron depletions in cracks; 10 percent gravel; slightly acid (pH 6.4); gradual wavy boundary.

E—16 to 21 inches; grayish brown (10YR 5/2) gravelly sandy loam, light brownish gray (10YR 6/2) dry; massive; moderately hard, friable, nonsticky and nonplastic; common fine roots in cracks; many fine and medium irregular pores; common coarse distinct dark yellowish brown (10YR 3/6) iron-manganese masses in cracks; 15 percent gravel; moderately acid (pH 5.9); gradual wavy boundary.

2Cd—21 to 60 inches; olive brown (2.5Y 4/3) sandy loam, olive brown (2.5Y 4/4) dry; massive; hard, firm, slightly sticky and slightly plastic; many fine and medium irregular pores; 5 percent gravel; neutral (pH 6.9).

Range in Characteristics

Mean annual soil temperature: 10 to 11 degrees C
Depth to densic contact: 20 to 40 inches
Reaction: Moderately acid to neutral
Depth to redoximorphic features: 7 to 9 inches
Particle-size control section: Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones
Clay content—5 to 18 percent

A horizon:
Hue—10YR or 7.5YR
Value—2 to 4 moist, 3 to 5 dry
Chroma—2 or 3 moist or dry
Rock fragment content—0 to 15 percent gravel

Bg horizon:
Hue—10YR or 2.5Y
Value—3 or 4 moist, 4 to 5 dry
Chroma—3 or 4 moist or dry
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones
Texture—coarse sandy loam or sandy loam

E horizon:
Hue—10YR or 2.5Y
Value—3 or 4 moist, 4 to 5 dry
Chroma—2 or 3 moist or dry
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones
Texture—coarse sandy loam or sandy loam

2Cd horizon:
Value—3 or 4 moist, 4 to 5 dry
Chroma—3 or 4 moist or dry
Rock fragment content—0 to 15 percent gravel
Texture—loam or sandy loam

Haro Series

Depth class: Shallow to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (K_{sat}): Moderately high to very high
Landscape: Hills, mountains
Landform: Hillslopes, mountain slopes
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 5 to 75 percent
Elevation: 0 to 1,500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy, isotic, mesic Lithic Ultic Haploxerolls

Typical Pedon

Haro loam in the soil survey of San Juan County, Washington; 900 feet north and 1,250 feet east of the southwest corner of section 25, T. 36 N., R. 4 W.; Roche Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 34 minutes 55 seconds north and longitude 123 degrees 8 minutes 35 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A1—0 to 1 inch; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine irregular pores; 3 percent gravel; strongly acid (pH 5.1); clear smooth boundary.
A2—1 to 5 inches; dark gray (10YR 4/1) gravelly loam, black (10YR 2/1) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine irregular pores; 20 percent gravel; strongly acid (pH 5.4); clear wavy boundary.
Bw—5 to 11 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and few coarse and very coarse roots; many very fine and fine irregular and common very fine and fine tubular pores; 30 percent gravel; moderately acid (pH 5.9); abrupt wavy boundary.
R—11 inches; metasedimentary rock.

Range in Characteristics

Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Average annual soil temperature: 50 to 54 degrees F
Soil moisture control section: Dry 75 to 90 days following summer solstice
Mollic epipedon thickness: 10 to 20 inches (A and Bw horizons)
Reaction: Moderately acid or strongly acid
Particle-size control section: Clay content—5 to 18 percent; rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

A1 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—8 to 18 percent
Rock fragment content—0 to 15 percent gravel

A2 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—loam or sandy loam
Clay content—5 to 18 percent
Rock fragment content—15 to 35 percent total

Bw horizon:
Hue—10YR or 7.5YR
Value—3 or 4 moist, 4 or 5 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam or loam
Clay content—5 to 18 percent
Rock fragment content—15 to 35 percent total

Hiddenridge Series

Depth class: Deep to lithic bedrock
Drainage class: Well drained
Capacity to transmit water (K_{sat}): High or very high
Landscape: Hills, mountains
Landform: Hillslopes, mountain slopes
Parent material: Glacial drift mixed with colluvium derived from metasedimentary rock
Slope range: 5 to 45 percent
Elevation: 0 to 1,500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy-skeletal, isotic, mesic Humic Dystroxerepts

Typical Pedon

Hiddenridge gravelly coarse sandy loam in the soil survey of San Juan County, Washington; 600 feet south and 1,850 feet west of the northeast corner of section 32, T. 37 N., R. 1 W.; Mount Constitution, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 39 minutes 29 seconds north and longitude 122 degrees 50 minutes 37 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt smooth boundary.
A1—1 to 3 inches; very dark grayish brown (10YR 3/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine irregular and interstitial pores; 20 percent gravel; strongly acid (pH 5.5); abrupt smooth boundary.
A2—3 to 24 inches; dark grayish brown (10YR 4/2) very gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine, medium,

and coarse roots; many very fine and fine irregular and interstitial pores; 40 percent gravel; strongly acid (pH 5.2); clear wavy boundary.

C—24 to 57 inches; olive brown (2.5Y 4/3) extremely gravelly coarse sandy loam, very dark grayish brown (2.5Y 3/2) moist; single grain; loose, nonsticky and nonplastic; common very fine, fine, and medium and few coarse roots; many very fine and fine irregular and many very fine and fine and common coarse interstitial pores; 70 percent gravel and 5 percent cobbles; strongly acid (pH 5.3); clear wavy boundary.

R—57 inches; metasedimentary rock.

Range in Characteristics

Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Average annual soil temperature: 50 to 54 degrees F
Soil moisture control section: Dry 75 to 90 days following summer solstice
Reaction: Moderately acid or strongly acid
Particle-size control section: Clay content—0 to 18 percent; rock fragment content—35 to 85 percent total, including 25 to 80 percent gravel and 0 to 10 percent cobbles

A1 horizon:
Hue—10YR to 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—5 to 18 percent
Rock fragment content—15 to 30 percent gravel

A2 horizon:
Hue—10YR to 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—loam, sandy loam, or coarse sandy loam
Clay content—5 to 18 percent
Rock fragment content—15 to 60 percent gravel

C horizon:
Hue—2.5Y to 10YR
Value—3 or 4 moist, 4 or 5 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam or coarse sandy loam
Clay content—0 to 18 percent
Rock fragment content—35 to 85 percent total, including 35 to 80 percent gravel and 0 to 10 percent cobbles

Hoypus Series

Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Capacity to transmit water (K_{sat}): High or very high
Landscape: Hills, drift plains
Landform: Hillslopes
Parent material: Glacial outwash
Slope range: 0 to 40 percent
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy-skeletal, isotic, mesic Typic Xerorthents

Typical Pedon

Hoypus sandy loam in the soil survey of San Juan County, Washington; 1,900 feet north and 900 feet east of the southwest corner of section 36, T. 32 N., R. 1 E.; Willamette Baseline Meridian; Coupeville, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 12 minutes 54 seconds north and longitude 122 degrees 37 minutes 50 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt smooth boundary.

A—1 to 5 inches; very dark grayish brown (10YR 3/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium and common coarse roots; many very fine and fine irregular and interstitial pores; 10 percent gravel; strongly acid (pH 5.4); clear wavy boundary.

Bw1—5 to 20 inches; yellowish brown (10YR 5/4) loamy sand, dark yellowish brown (10YR 3/4) moist; single grain; loose, nonsticky and nonplastic; many fine and medium and common coarse roots; many very fine, fine, and medium irregular and interstitial pores; 10 percent gravel; strongly acid (pH 5.3); clear wavy boundary.

Bw2—20 to 36 inches; brown (10YR 5/3) very gravelly loamy sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; common fine roots; many very fine, fine, and medium irregular and interstitial pores; 55 percent gravel; strongly acid (pH 5.5); clear wavy boundary.

C—36 to 60 inches; extremely gravelly sand that is variegated with 50 percent light colors, 30 percent dark colors, and 20 percent medium colors; single grain; loose, nonsticky and nonplastic; few fine roots; many very fine irregular and interstitial pores; 55 percent gravel and 5 percent cobbles; moderately acid (pH 5.9).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Particle-size control section: Rock fragment content—35 to 75 percent total, including 35 to 60 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones
Clay content—0 to 5 percent

A horizon:
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 to 3 moist or dry
Reaction—moderately acid or strongly acid

Bw1 horizon:
Hue—7.5YR or 10YR
Value—3 or 4 moist or dry
Chroma—3 or 4 moist or dry
Reaction—moderately acid or strongly acid
Texture—loamy sand or sandy loam
Clay content—3 to 5 percent
Rock fragment content—5 to 50 percent total, including 5 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Bw2 horizon:
Hue—7.5YR or 10YR
Value—3 or 4 moist or dry
Chroma—3 or 4 moist or dry
Reaction—moderately acid or strongly acid

Texture—loamy sand or sand
Clay content—1 to 5 percent
Rock fragment content—35 to 80 percent total, including 35 to 65 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

C horizon:
Reaction—slightly acid or moderately acid
Texture—loamy sand or sand
Clay content—0 to 5 percent
Rock fragment content—35 to 80 percent total, including 35 to 65 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Indianola Series

Depth class: Very deep (more than 60 inches) (fig. 22)
Drainage class: Somewhat excessively drained
Capacity to transmit water (K_{sat}): High or very high
Landscape: Hills, drift plains
Landform: Hillslopes
Parent material: Glacial outwash
Slope range: 0 to 30 percent
Elevation: 0 to 520 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Isotic, mesic Dystric Xeropsamments

Typical Pedon

Indianola loamy sand in the soil survey of San Juan County, Washington; 2,200 feet east and 2,550 feet north of the southwest corner of section 1, T. 17 N., R. 2 W.; Willamette Baseline Meridian; latitude 46 degrees 59 minutes 18 seconds north and longitude 122 degrees 52 minutes 40 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt smooth boundary.
A—1 to 6 inches; very dark grayish brown (10YR 3/2) loamy sand, black (10YR 2/1) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; neutral (pH 6.8); clear wavy boundary.
Bw1—6 to 17 inches; yellowish brown (10YR 5/4) loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; neutral (pH 6.8); clear wavy boundary.
Bw2—17 to 27 inches; yellowish brown (10YR 5/4) sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; neutral (pH 6.6); clear wavy boundary.
BC—27 to 37 inches; pale brown (10YR 6/3) sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common fine roots; many very fine and fine interstitial pores; neutral (pH 6.8); gradual wavy boundary.
C—37 to 60 inches; pale brown (10YR 6/3) sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; neutral (pH 6.6).

Figure 22.—Typical profile of an Indianola soil. This soil is very deep and very sandy. It consists mainly of well-sorted glacial outwash deposits. The Indianola soils have a low plant available water holding capacity. The numerals on the tape indicate inches.

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Reaction: Neutral to moderately acid
Particle-size control section: Rock fragment content—0 to 15 percent gravel

A horizon:
Hue—10YR, 7.5YR, or 5YR
Value—2 or 3 moist, 3 to 6 dry
Chroma—1 to 4 moist or dry

Bw horizon:
Hue—10YR, 7.5YR, or 5YR
Value—2 to 4 moist, 4 to 6 dry
Chroma—1 to 4 moist or dry
Texture—loamy sand or loamy fine sand

BC horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 6 or 7 dry
Chroma—3 or 4 moist or dry
Texture—loamy sand, sand, or fine sand

C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6 moist, 5 to 7 dry
Chroma—2 to 4 moist or dry
Texture—loamy sand or sand

Keystone Series

Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Capacity to transmit water (K_{sat}): High or very high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Glacial outwash
Slope range: 0 to 3 percent
Elevation: 130 to 220 feet
Mean annual precipitation: 20 to 35 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Isotic, mesic Dystric Xeropsamments

Typical Pedon

Keystone sandy loam in the soil survey of San Juan County, Washington; 375 feet south and 1,250 feet west of the northeast corner of section 22, T. 35 N., R. 3 W.; Willamette Baseline Meridian; Friday Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 31 minutes 14 seconds north and longitude 123 degrees 2 minutes 40 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; clear smooth boundary.
A1—1 to 3 inches; dark grayish brown (10YR 4/2) sandy loam, black (10YR 2/1) moist; strong coarse granular structure; slightly hard, very friable, nonsticky and

nonplastic; many very fine, fine, and medium roots; moderately acid (pH 5.7); clear wavy boundary.

A2—3 to 8 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; 5 percent gravel; moderately acid (pH 5.6); clear wavy boundary.

Bw1—8 to 19 inches; light yellowish brown (2.5Y 6/4) loamy sand, olive brown (2.5Y 4/3) moist; single grain; loose, nonsticky and nonplastic; common fine and many medium and coarse roots; 5 percent gravel; strongly acid (pH 5.5); clear wavy boundary.

Bw2—19 to 34 inches; light yellowish brown (2.5Y 6/4) very gravelly loamy sand, light olive brown (2.5Y 5/3) moist; single grain; loose, nonsticky and nonplastic; few fine and medium roots; 25 percent gravel, 5 percent cobbles, and 5 percent stones; moderately acid (pH 6.0); clear wavy boundary.

C—34 to 60 inches; light yellowish brown (2.5Y 6/3) loamy sand, light olive brown (2.5Y 5/3) moist; massive; moderately hard, friable, nonsticky and nonplastic; 5 percent gravel; slightly acid (pH 6.3).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Reaction: Slightly acid to strongly acid
Particle-size control section: Clay content—0 to 8 percent; rock fragment content—averages 0 to 35 percent total, including 0 to 35 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

A1 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 4 to 6 dry
Chroma—1 to 3 moist or dry
Texture—fine sandy loam, sandy loam, or loamy sand
Clay content—0 to 8 percent
Rock fragment content—0 to 15 percent gravel

A2 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 4 to 6 dry
Chroma—1 to 3 moist or dry
Reaction—slightly acid or moderately acid
Texture—sandy loam or loamy sand
Clay content—0 to 8 percent
Rock fragment content—0 to 35 percent gravel

Bw horizon:
Hue—10YR or 7.5YR
Value—3 to 5 moist, 5 to 7 dry
Chroma—2 to 5 moist or dry
Reaction—slightly acid to strongly acid
Texture—loamy sand or sand
Clay content—0 to 5 percent
Rock fragment content—averages 0 to 35 percent total, including 0 to 60 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

C horizon:
Hue—10YR or 2.5Y
Value—2 to 4 moist, 5 to 7 dry

Chroma—2 to 4 moist or dry
Reaction—slightly acid or moderately acid
Texture—loamy sand or coarse sand
Clay content—0 to 5 percent
Rock fragment content—0 to 15 percent gravel

Killebrew Series

Depth class: Moderately deep to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Hills, mountains
Landform: Hillslopes, mountain slopes
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 5 to 10 percent
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Fine-loamy, mixed, superactive, mesic Aquultic Haploxeralfs

Typical Pedon

Killebrew sandy loam in the soil survey of San Juan County, Washington; 1,900 feet south and 200 feet west of northeast corner of section 34, T. 35 N., R. 2 W.; Richardson, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 29 minutes 14 seconds north and longitude 122 degrees 54 minutes 38 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt wavy boundary.

A—1 to 5 inches; very dark brown (10YR 2/2) sandy loam, very dark grayish brown (10YR 3/2) dry; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium and coarse roots; many very fine and fine irregular pores; 10 percent gravel; very strongly acid (pH 5.0); clear wavy boundary.

Bw—5 to 9 inches; brown (7.5YR 4/3) sandy loam, brown (7.5YR 5/4) dry; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots; many very fine and fine irregular pores; 10 percent gravel; moderately acid (pH 5.6); clear wavy boundary.

E—9 to 17 inches; grayish brown (2.5Y 5/2) gravelly sandy loam, light brownish gray (2.5Y 6/2) dry; massive; hard, firm, nonsticky and nonplastic; few very fine roots; few very fine and fine irregular pores; 30 percent dark yellowish brown (10YR 4/6) iron-manganese masses, yellowish brown (10YR 5/8) dry, in matrix; 20 percent gravel and 5 percent cobbles; moderately acid (pH 6.0); gradual wavy boundary.

2Btg—17 to 27 inches; olive brown (2.5Y 4/4) silt loam, light olive brown (2.5Y 5/4) dry; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots in cracks; few very fine and fine tubular pores; 20 percent grayish brown (2.5Y 5/2) iron depletions, light brownish gray (2.5Y 6/2) dry, and 40 percent dark yellowish brown (10YR 4/6) iron-manganese masses, yellowish brown (10YR 5/8) dry; 5 percent gravel; slightly acid (pH 6.4); clear wavy boundary.

2Cd—27 to 60 inches; olive brown (2.5Y 4/3) loam, light olive brown (2.5Y 5/3) dry; massive; hard, firm, slightly sticky and slightly plastic; 10 percent gravel; neutral (pH 7.3).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Average annual soil temperature: 50 to 52 degrees F
Moisture control section: Dry 75 to 90 days following summer solstice
Depth to redoximorphic features: 9 to 18 inches
Particle-size control section: Clay content—18 to 35 percent; rock fragment content—0 to 15 percent fine gravel

A horizon:
Value—2 or 3 moist, 3 to 5 dry
Chroma—2 or 3 moist or dry

Bw horizon:
Value—3 or 4 moist, 4 or 5 dry
Chroma—3 or 4 moist or dry
Texture—sandy loam or loam
Clay content—8 to 18 percent
Rock fragment content—0 to 35 percent total, including 5 to 35 percent gravel and 0 to 5 percent cobbles

E horizon:
Value—4 or 5 moist, 5 to 7 dry
Chroma—1 to 2 moist or dry
Texture—sandy loam or loam
Clay content—4 to 12 percent
Rock fragment content—0 to 35 percent total, including 5 to 35 percent gravel and 0 to 5 percent cobbles

2Btg horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 to 4 moist or dry
Texture—loam, silt loam, or silty clay loam
Clay content—18 to 35 percent
Rock fragment content—5 to 35 percent gravel

2Cd horizon:
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 or 3 moist or dry
Texture—loam, sandy loam, or silt loam
Clay content—12 to 27 percent
Rock fragment content—0 to 15 percent gravel

Limepoint Series

Depth class: Deep to dense material
Drainage class: Poorly drained
Capacity to transmit water (K_{sat}): Very low to very high
Landscape: Drift plains
Landform: Drainageways, valleys
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 3 percent
Elevation: 0 to 540 feet
Mean annual precipitation: 20 to 40 inches

Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Coarse-loamy, isotic, mesic Typic Epiaquolls

Typical Pedon

Limepoint mucky silt loam in the soil survey of San Juan County, Washington; 2,550 feet north and 200 feet east of the southwest corner of section 25, T. 36 N., R. 4 W.; Willamette Baseline Meridian; Roche Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 35 minutes 12 seconds north and longitude 123 degrees 8 minutes 51 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

A1—0 to 6 inches; black (10YR 2/1) mucky silt loam, very dark grayish brown (10YR 3/2) dry; moderate coarse granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; common very fine and fine dendritic tubular pores; slightly acid (pH 6.4); abrupt smooth boundary.

A2—6 to 14 inches; very dark grayish brown (10YR 3/2) loam, dark grayish brown (10YR 4/2) dry; moderate coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine dendritic tubular pores; 10 percent medium distinct irregular dark yellowish brown (10YR 4/4) iron-manganese masses, dark yellowish brown (10YR 4/6) dry, with sharp boundaries throughout; 5 percent gravel; slightly acid (pH 6.5); abrupt wavy boundary.

Bg—14 to 31 inches; grayish brown (10YR 5/2) loamy coarse sand, light brownish gray (10YR 6/2) dry; massive; soft, very friable, nonsticky and nonplastic; few fine roots; few very fine and fine dendritic tubular pores; 50 percent coarse distinct irregular dark yellowish brown (10YR 4/4) iron-manganese masses, dark yellowish brown (10YR 4/6) dry, with diffuse boundaries throughout; neutral (pH 6.7); abrupt wavy boundary.

Cg1—31 to 49 inches; grayish brown (10YR 5/2) loam, light gray (10YR 7/2) dry; massive; soft, very friable, slightly sticky and slightly plastic; few very fine and fine irregular pores; 10 percent medium distinct irregular dark yellowish brown (10YR 4/4) iron-manganese masses, dark yellowish brown (10YR 4/6) dry, with clear boundaries in cracks; neutral (pH 6.8); clear wavy boundary.

Cg2—49 to 58 inches; gray (10YR 6/1) sandy loam, light gray (10YR 7/1) dry; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine irregular pores; 2 percent medium distinct irregular dark yellowish brown (10YR 4/4) iron-manganese masses, dark yellowish brown (10YR 4/6) dry, with clear boundaries throughout; neutral (pH 7.0); abrupt wavy boundary.

2Cd—58 to 60 inches; gray (10YR 5/1) silty clay loam, gray (10YR 6/1) dry; massive; extremely hard, extremely firm, moderately sticky and moderately plastic; 5 percent gravel; neutral (pH 7.0).

Range in Characteristics

Depth to restrictive feature: 40 to 60 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Depth to redoximorphic features: 3 to 9 inches
Mollic epipedon thickness: 10 to 14 inches
Reaction: Slightly acid or neutral
Particle-size control section: Clay content—2 to 18 percent; rock fragment content—0 to 35 percent gravel

A horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist
Clay content—7 to 18 percent
Rock fragment content—0 to 15 percent gravel

Bg horizon:
Value—4 or 5 moist, 5 or 6 dry
Chroma—1 or 2 moist or dry
Texture—loamy coarse sand, loam, sand, or sandy loam
Clay content—2 to 18 percent
Rock fragment content—0 to 35 percent gravel

Cg horizon:
Value—5 or 6 moist, 6 or 7 dry
Chroma—1 or 2 moist or dry
Texture—loam, sandy loam, or sand
Clay content—2 to 18 percent
Rock fragment content—0 to 35 percent gravel

2Cd horizon:
Value—5 or 6 moist, 6 or 7 dry
Chroma—1 or 2 moist, 2 or 3 dry
Texture—silt loam, silty clay loam, or clay loam
Clay content—15 to 40 percent
Rock fragment content—0 to 15 percent gravel

Mitchellbay Series

Depth class: Moderately deep to dense material (fig. 23)
Drainage class: Somewhat poorly drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Valleys
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 15 percent
Elevation: 0 to 310 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Fine-loamy, mixed, superactive, mesic Aquultic Haploxeralfs

Typical Pedon

Mitchellbay gravelly sandy loam in the soil survey of San Juan County, Washington; 1,900 feet south and 1,000 feet east of the northwest corner of section 19, T. 36 N., R. 3 W.; Willamette Baseline Meridian; Friday Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 36 minutes 12 seconds north and longitude 123 degrees 7 minutes 20 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt smooth boundary.

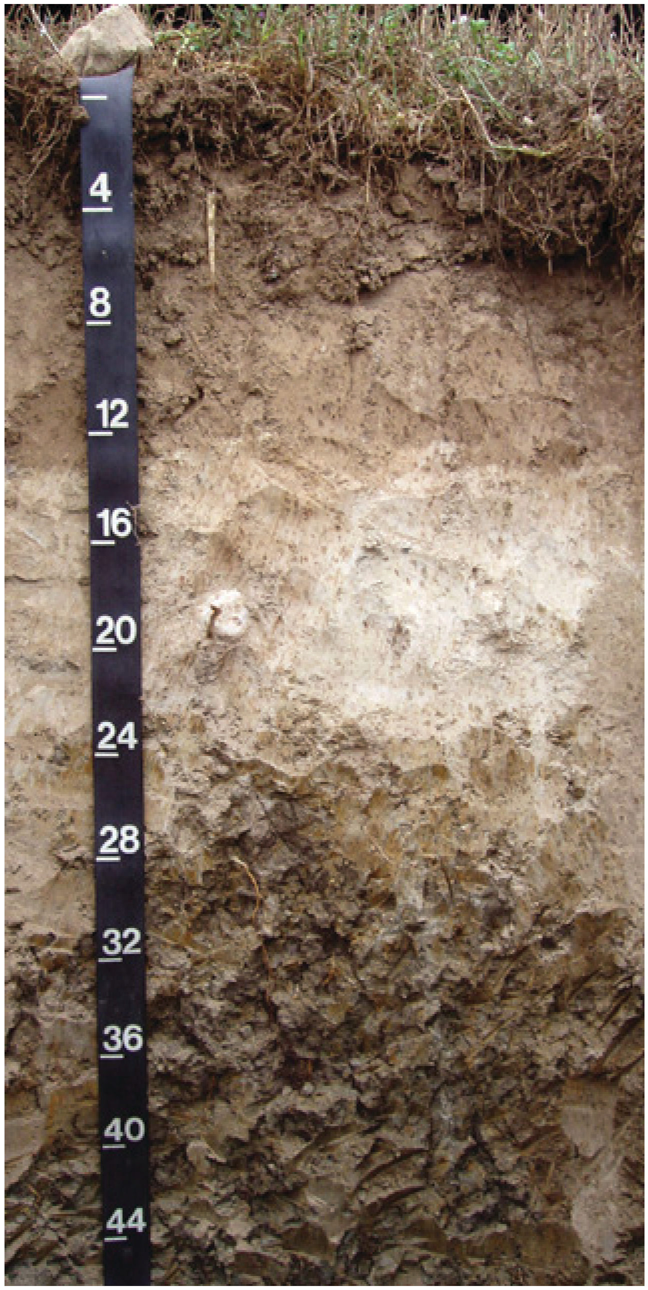

Figure 23.—Typical profile of a Mitchellbay soil. This soil has a compact, dense horizon at a depth of 20 to 40 inches. In this profile, it is at a depth of about 38 inches. Water perches on the dense horizon during the wet season, which results in redoximorphic features. The light-colored material between depths of 12 and 28 inches is a result of removal of iron and manganese by reduction during wet periods.

A—1 to 6 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial and irregular pores; 15 percent gravel; very strongly acid (pH 5.0); clear wavy boundary.

Bw—6 to 15 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; many very fine and fine irregular and interstitial pores; 10 percent gravel; moderately acid (pH 5.6); clear wavy boundary.

E—15 to 20 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure; moderately hard, firm, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common fine tubular and interstitial pores; 5 percent gravel; moderately acid (pH 6.0); gradual wavy boundary.

2Btg1—20 to 26 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; moderate very coarse prismatic structure; very hard, extremely firm, moderately sticky and moderately plastic; common very fine, fine, and medium roots; common fine tubular and interstitial pores; 50 percent distinct weakly cemented iron-manganese concretions on faces of peds; 5 percent gravel; slightly acid (pH 6.4); gradual wavy boundary.

2Btg2—26 to 38 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; moderate very coarse prismatic structure; very hard, extremely firm, moderately sticky and moderately plastic; common very fine and fine and few medium roots; common fine tubular and interstitial pores; 50 percent distinct weakly cemented iron-manganese concretions on faces of peds; 5 percent gravel; slightly acid (pH 6.4); gradual wavy boundary.

2Cd—38 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive; very hard, extremely firm, slightly sticky and slightly plastic; 20 percent distinct weakly cemented iron-manganese masses in cracks; neutral (pH 7.3).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Depth to redoximorphic features: 9 to 18 inches
Particle-size control section: Clay content—18 to 35 percent; rock fragment content—0 to 15 percent gravel

A horizon:
Value—2 or 3 moist, 4 or 5 dry
Chroma—2 or 3 moist or dry

Bw horizon:
Value—3 or 4 moist, 4 or 5 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam or loam
Clay content—8 to 18 percent
Rock fragment content—0 to 15 percent total, including 0 to 15 percent gravel

E horizon:
Value—4 or 5 moist, 5 to 7 dry
Chroma—1 to 2 moist or dry
Texture—sandy loam or loam
Clay content—4 to 12 percent
Rock fragment content—0 to 15 percent gravel

2Btg horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist, 5 to 7 dry
Chroma—2 or 3 moist or dry
Texture—loam, silt loam, or silty clay loam

Clay content—18 to 35 percent
Rock fragment content—0 to 15 percent gravel

2Cd horizon:
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 or 3 moist or dry
Texture—loam, sandy loam, or silt loam
Clay content—12 to 27 percent
Rock fragment content—0 to 15 percent gravel

Morancreek Series

Depth class: Very deep (more than 60 inches)
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Moderately high or high
Landscape: Hills, mountains
Landform: Hillslopes, mountain slopes
Parent material: Glacial drift
Slope range: 2 to 25 percent
Elevation: 0 to 900 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Coarse-loamy, isotic, mesic Aquic Dystroxerepts

Typical Pedon

Morancreek sandy loam in the soil survey of San Juan County, Washington; 2,400 feet west and 450 feet south of the northeast corner of section 13, T. 35 N., R 4 W.; Roche Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 32 minutes 6 seconds north and longitude 123 degrees 8 minutes 10 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed plant material; abrupt smooth boundary.

A—1 to 3 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; many very fine and fine irregular pores; moderately acid (pH 5.6); clear wavy boundary.

Bw1—3 to 10 inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many medium, common coarse, and few fine roots; many very fine and fine irregular pores; moderately acid (pH 5.8); gradual wavy boundary.

Bw2—10 to 21 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; few fine and coarse and common medium roots; many very fine and fine irregular pores; moderately acid (pH 5.8); gradual wavy boundary.

Bg—21 to 28 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few medium and coarse roots; few very fine and fine irregular pores; 10 percent medium prominent irregular very weakly cemented yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with diffuse boundaries throughout and 15 percent medium faint irregular very weakly cemented gray (10YR 6/1) iron depletions, dark gray (10YR 4/1) moist, with diffuse

boundaries throughout; 5 percent gravel; moderately acid (pH 6.0); gradual wavy boundary.

C—28 to 60 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; many very fine irregular and few fine tubular pores; 50 percent medium prominent irregular very weakly cemented yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with diffuse boundaries throughout; slightly acid (pH 6.2).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Depth to redoximorphic features: 15 to 30 inches
Reaction: Moderately acid or slightly acid
Particle-size control section: Clay content—4 to 17 percent; rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

A horizon:
Value—2 or 3 moist, 3 to 5 dry
Chroma—2 to 4 moist, 2 to 4 dry
Clay content—4 to 12 percent

Bw horizon:
Hue—10YR or 7.5YR
Value—3 or 4 moist, 4 or 5 dry
Chroma—2 to 6 moist or dry
Texture—sandy loam, loam, or silt loam
Clay content—4 to 14 percent
Rock fragment content—0 to 35 percent total, including 0 to 25 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Bg horizon:
Value—3 or 4 moist, 4 to 6 dry
Chroma—2 to 4 moist or dry
Texture—sandy loam, coarse sandy loam, or loamy fine sand
Clay content—5 to 14 percent
Rock fragment content—5 to 35 percent total, including 5 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

C horizon:
Value—4 or 5 moist, 6 or 7 dry
Texture—sandy loam, coarse sandy loam, or loamy fine sand
Clay content—4 to 12 percent
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Orcas Series

Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Capacity to transmit water (K_{sat}): Moderately high or high
Landscape: Drift plains
Landform: Depressions
Parent material: Slightly decomposed plant material

Slope range: 0 to 2 percent
Elevation: 0 to 340 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Dysic, mesic Typic Sphagnofibrists

Typical Pedon

Orcas peat in the soil survey of San Juan County, Washington; 2,300 feet north and 2,200 feet east of the southwest corner of section 18, T. 30 N., R. 7 E.; False Bay, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 5 minutes 9 seconds north and longitude 121 degrees 57 minutes 35 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oi1—0 to 3 inches; peat; about 90 percent fiber, 80 percent rubbed; weak thick platy structure; very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine tubular pores; extremely acid (pH 4.4); clear smooth boundary.
Oi2—3 to 12 inches; peat; about 95 percent fiber, 90 percent rubbed; weak thick platy structure; very friable, nonsticky and nonplastic; few fine roots; few very fine and fine tubular pores; extremely acid (pH 4.4); gradual smooth boundary.
Oi3—12 to 60 inches; peat; about 95 percent fiber, 90 percent rubbed; massive; very friable, nonsticky and nonplastic; few very fine and fine tubular pores; extremely acid (pH 4.4).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 47 to 50 degrees F

Oi1 horizon:
Hue—2.5YR to 10YR
Value—2 to 4 moist, 4 or 5 dry
Chroma—2 to 4 moist or dry

Oi2 and Oi3 horizons:
Hue—5YR to 10YR
Value—3 to 7 moist, 4 to 6 dry
Chroma—3 to 8 moist or dry
Fiber content—70 to 95 unrubbed, 50 to 90 percent rubbed
Reaction—extremely acid or very strongly acid

Oxyaquic Xerorthents

Depth class: Deep to dense material
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Very low to very high
Landscape: Shore complexes
Landform: Hillslopes, sea cliffs
Parent material: Beach sand and colluvium derived from glacial drift
Slope range: 15 to 70 percent
Elevation: 0 to 250 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Oxyaquic Xerorthents

Typical Pedon

Oxyaquic Xerorthents sand in an area of Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes; 980 feet west and 920 feet north of the southeast corner of section 16, T. 33 N., R. 2 E.; Crescent Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 20 minutes 33 seconds north and longitude 122 degrees 33 minutes 13 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 2 inches; slightly decomposed plant material; extremely acid (pH 3.5); abrupt smooth boundary.

Oe—2 to 5 inches; moderately decomposed plant material; extremely acid (pH 3.5); abrupt smooth boundary.

A—5 to 9 inches; very dark brown (10YR 2/2) sand, black (10YR 2/1) moist; single grain; loose, nonsticky and nonplastic; many very fine, fine, and medium and common coarse roots; common fine and very fine interstitial pores; moderately acid (pH 5.8); clear smooth boundary.

Bw—9 to 11 inches; brown (10YR 5/3) sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; common fine interstitial and irregular pores and common very fine interstitial pores; moderately acid (pH 5.8); clear wavy boundary.

C1—11 to 19 inches; gray (2.5Y 5/1) sand, dark gray (2.5Y 4/1) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine and few medium roots; common fine and very fine interstitial pores; moderately acid (pH 6.0); gradual wavy boundary.

C2—19 to 36 inches; gray (2.5Y 5/1) sand, dark gray (2.5Y 4/1) moist; single grain; loose, nonsticky and nonplastic; few fine, medium, coarse, and very coarse roots; common fine and very fine interstitial pores; moderately acid (pH 5.8); clear wavy boundary.

2Cg—36 to 58 inches; gray (2.5Y 5/1) very fine sandy loam, dark gray (2.5Y 4/1) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; common very fine interstitial pores; 5 percent coarse distinct irregular light brownish gray (2.5Y 6/2) iron depletions, grayish brown (2.5Y 5/2) moist, with diffuse boundaries throughout and 5 percent coarse distinct irregular yellowish brown (10YR 5/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with diffuse boundaries throughout; slightly acid (pH 6.4); abrupt wavy boundary.

2Cd—58 to 83 inches; gray (2.5Y 5/1) very fine sandy loam, dark gray (2.5Y 4/1) moist; massive; moderately hard, friable, nonsticky and nonplastic; very few very fine interstitial pores; slightly acid (pH 6.4).

Range in Characteristics

Depth to restrictive feature: 40 to 60 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Moisture control section: Dry 60 to 75 days following summer solstice
Depth to redoximorphic features: 30 to 50 inches
Reaction: Slightly acid or moderately acid
Particle-size control section: Clay content—2 to 20 percent; rock fragment content—0 to 5 percent gravel

A horizon:
Hue—10YR
Value—2 to 5 moist or dry
Chroma—1 to 4 moist or dry
Rock fragment content—0 to 5 percent gravel

Bw horizon:
Hue—10YR
Value—3 to 5 moist or dry
Chroma—3 or 4 moist or dry
Texture—sand, sandy loam, or loamy sand
Rock fragment content—0 to 5 percent gravel

C horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist or dry
Chroma—1 to 3 moist or dry
Texture—sand, sandy loam, or loamy sand
Rock fragment content—0 to 5 percent gravel

2Cg horizon:
Hue—5Y or 2.5Y
Value—3 to 5 moist or dry
Chroma—1 or 2 moist or dry
Texture—sandy loam, loam, or silt loam
Rock fragment content—0 to 5 percent gravel

2Cd horizon:
Hue—5Y or 2.5Y
Value—3 to 5 moist or dry
Chroma—1 or 2 moist or dry
Texture—silt loam, very fine sandy loam, or loam
Rock fragment content—0 to 5 percent gravel

Pilepoint Series

Depth class: Moderately deep to dense material
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Very low to very high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Eolian sand over glacial outwash and dense glaciomarine deposits
Slope range: 0 to 8 percent
Elevation: 16 to 140 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Fine-loamy, mixed, superactive, mesic Xeric Argialbolls

Typical Pedon

Pilepoint loam in the soil survey of San Juan County, Washington, in an area of hayland; 2,500 feet north and 1,000 feet west of the southeast corner of section 3, T. 34 N., R. 3 W.; False Bay, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 28 minutes 14 seconds north and longitude 123 degrees 2 minutes 37 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate medium granular structure and moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine and fine irregular pores; 10 percent gravel; moderately acid (pH 5.7); clear wavy boundary.

A2—4 to 13 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; moderate medium granular structure and moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine and fine irregular pores; 10 percent gravel; moderately acid (pH 5.8); clear wavy boundary.
Bw—13 to 22 inches; dark brown (10YR 3/3) very gravelly sandy loam, very dark brown (10YR 2/2) moist; single grain; loose, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial and irregular pores; 40 percent gravel; moderately acid (pH 5.8); clear wavy boundary.
E—22 to 29 inches; grayish brown (2.5Y 5/2) gravelly loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine irregular pores; 15 percent gravel and 5 percent cobbles; moderately acid (pH 5.9); abrupt wavy boundary.
2Btg—29 to 36 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; strong coarse subangular blocky structure; moderately hard, friable, moderately sticky and moderately plastic; few very fine roots throughout and many very fine roots in cracks; common very fine and fine irregular pores; 10 percent discontinuous faint clay films on faces of peds; 60 percent prominent brownish yellow (10YR 6/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with diffuse boundaries throughout; 5 percent gravel; moderately acid (pH 5.9); gradual irregular boundary.
2Cd1—36 to 46 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; very hard, very firm, moderately sticky and moderately plastic; few very fine roots in cracks; 5 percent prominent brownish yellow (10YR 6/6) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, with diffuse boundaries in cracks; 5 percent gravel; slightly acid (pH 6.3); gradual irregular boundary.
2Cd2—46 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; massive; very hard, very firm, moderately sticky and moderately plastic; few very fine roots in cracks; 5 percent gravel; slightly acid (pH 6.3).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Average annual soil temperature: 50 to 54 degrees F
Soil moisture control section: Dry 75 to 90 days following summer solstice
Depth to redoximorphic features: 22 to 30 inches
Reaction: Moderately acid or slightly acid
Particle-size control section: Clay content—18 to 35 percent; rock fragment content—0 to 15 percent gravel

A horizon:
Value—3 or 4 dry, 2 or 3 moist
Chroma—1 or 2 moist or dry
Clay content—8 to 18 percent
Rock fragment content—0 to 35 percent gravel

Bw horizon:
Value—3 or 4 dry, 2 or 3 moist
Chroma—2 or 3 moist or dry
Texture—sandy loam, loamy sand, or loamy coarse sand
Clay content—3 to 12 percent
Rock fragment content—15 to 60 percent total, including 15 to 60 percent gravel and 0 to 10 percent cobbles

E horizon:
Value—5 or 6 dry, 4 or 5 moist
Chroma—1 to 2 moist or dry
Texture—loamy sand or sandy loam
Clay content—2 to 8 percent
Rock fragment content—0 to 35 percent total, including 15 to 50 percent gravel and 0 to 10 percent cobbles

2Btg horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 or 3 moist or dry
Texture—silt loam, silty clay loam, or loam
Clay content—18 to 35 percent
Rock fragment content—0 to 15 percent gravel

2Cd horizon:
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 or 3 moist or dry
Texture—silt loam, loam, or sandy loam
Clay content—12 to 27 percent
Rock fragment content—0 to 15 percent gravel

Puget Series

Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Capacity to transmit water (K_{sat}): Moderately low to moderately high
Landform: Tidal flats
Parent material: Alluvium
Slope range: 0 to 2 percent
Elevation: 0 to 10 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Fine-silty, mixed, superactive, nonacid, mesic Fluvaquentic Endoaquepts

Typical Pedon

Puget silty clay loam in the soil survey of King County, Washington, 0.5 mile southwest of Carnation; 2,640 feet north and 600 feet east of the southwest corner of section 21, T. 25 N., R. 7 E.; Carnation, Washington, U.S. Geological Survey quadrangle; latitude 47 degrees 38 minutes 13 seconds north and longitude 121 degrees 55 minutes 47 seconds west; NAD 83. (Colors are for moist colors otherwise noted.)

A—0 to 7 inches; dark grayish brown (2.5Y 4/2) silty clay loam, light gray (2.5Y 7/2) dry; common fine prominent dark brown (7.5YR 4/4) redoximorphic concentrations; moderate very coarse prismatic structure; hard, firm, moderately sticky and moderately plastic; many roots; moderately acid (pH 6.0); clear smooth boundary.

Bg1—7 to 17 inches; dark grayish brown (2.5Y 5/2) silty clay loam, light olive gray (2.5Y 7/2) dry; common medium prominent strong brown (7.5YR 5/6, 5/8) redoximorphic concentrations; moderate medium prismatic structure; hard, firm,

moderately sticky and moderately plastic; many roots; slightly acid (pH 6.2); clear smooth boundary.

Bg2—17 to 25 inches; grayish brown (2.5Y 5/2) silty clay loam, light olive gray (5Y 6/2) dry; many medium prominent yellowish red (5YR 5/8, 4/8) redoximorphic concentrations; strong very coarse prismatic structure; very hard, firm, moderately sticky and moderately plastic; common roots; slightly acid (pH 6.4); abrupt smooth boundary.

Bg3—25 to 31 inches; grayish brown (2.5Y 5/2) silty clay loam, light gray (5Y 7/2) dry; many medium prominent dark yellowish brown (10YR 3/6) and yellowish red (5YR 5/8, 4/6) redoximorphic concentrations; moderate medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; few roots; moderately acid (pH 6.0); abrupt wavy boundary.

Bg4—31 to 40 inches; grayish brown (2.5Y 5/2) silty clay loam, light gray (5Y 7/1) dry; common fine prominent strong brown (7.5YR 5/6) and yellowish red (5YR 4/8) redoximorphic concentrations; strong very coarse prismatic structure; hard, firm, moderately sticky and moderately plastic; few roots; moderately acid (pH 5.8); clear smooth boundary.

Cg1—40 to 45 inches; greenish gray (5GY 5/1) silty clay loam, light gray (5Y 7/1) and white (5Y 8/1) dry; common fine prominent strong brown (7.5YR 5/6) and brown (7.5YR 4/4) redoximorphic concentrations; massive; hard, firm, moderately sticky and moderately plastic; moderately acid (pH 5.8); clear smooth boundary.

Cg2—45 to 60 inches; gray (5Y 5/1) silty clay, light gray (5Y 7/1) dry; few fine prominent yellowish red (5YR 4/8, 5/8) and common medium distinct light olive brown (2.5Y 5/4) redoximorphic concentrations; massive; very hard, firm, moderately sticky and moderately plastic, moderately acid (pH 6.0).

Range in Characteristics

Depth to diagnostic horizons and features are from mineral soil surface.

Mean annual soil temperature: 48 to 50 degrees F
Depth to redoximorphic features: 0 to 5 inches
Particle-size control section: Rock fragment content—0 to 5 percent gravel; clay content—18 to 35 percent; sand content—less than 15 percent fine sand or coarser

A horizon:
Hue—2.5Y or 10YR
Value—3 to 5 moist, 4 to 7 dry
Chroma—1 or 2 dry or moist
Reaction—moderately acid to neutral

Bg horizon:
Hue—2.5Y or 10YR
Value—4 or 5 moist, 6 or 7 dry
Texture—silt loam or silty clay loam with thin strata (less than 2 inches thick) of sand or loamy sand in some pedons
Reaction—slightly acid to very strongly acid

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or 5GY
Value—4 or 5 moist, 6 or 7 dry
Chroma—0 to 2 dry or moist
Texture—silt loam, silty clay loam, or silty clay with strata of sand or loamy sand
Reaction—slightly acid to very strongly acid

San Juan Series

Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Capacity to transmit water (K_{sat}): High or very high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Eolian sand over glacial outwash
Slope range: 0 to 20 percent
Elevation: 0 to 220 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy, isotic, mesic Pachic Ultic Haploxerolls

Typical Pedon

San Juan sandy loam in the soil survey of San Juan County, Washington; 600 feet south and 2,000 feet west of the northeast corner of section 12, T. 34 N., R. 3 W.; Willamette Baseline Meridian; False Bay, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 27 minutes 43 seconds north and longitude 123 degrees 0 minutes 15 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches; dark gray (10YR 4/1) sandy loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine irregular pores; strongly acid (pH 5.1); abrupt smooth boundary.

A2—4 to 13 inches; dark gray (10YR 4/1) sandy loam, black (10YR 2/1) moist; medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine irregular pores; 5 percent fine gravel; moderately acid (pH 5.8); abrupt smooth boundary.

A3—13 to 19 inches; dark gray (10YR 4/1) sandy loam, black (10YR 2/1) moist; medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine irregular pores; 5 percent fine gravel; slightly acid (pH 6.4); clear wavy boundary.

Bw—19 to 27 inches; brown (10YR 4/3) gravelly loamy coarse sand, very dark brown (10YR 2/2) moist; medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 30 percent gravel; slightly acid (pH 6.5); clear wavy boundary.

C1—27 to 41 inches; variegated mineral colored extremely gravelly coarse sand; single grain; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 80 percent gravel; neutral (pH 6.8); clear wavy boundary.

C2—41 to 62 inches; variegated mineral colored extremely gravelly coarse sand; single grain; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 75 percent gravel; neutral (pH 6.7); clear wavy boundary.

C3—62 to 69 inches; variegated mineral colored extremely gravelly coarse sand; single grain; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 75 percent gravel; neutral (pH 6.9).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Mollic epipedon thickness: 20 to 32 inches

Particle-size control section: Clay content—0 to 12 percent; rock fragment content—15 to 35 percent total, including 0 to 35 percent gravel and 0 to 15 percent cobbles

A1 horizon:
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—5 to 12 percent
Rock fragment content—0 to 15 percent gravel

A2 and A3 horizons:
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Reaction—moderately acid or slightly acid
Texture—sandy loam, loam, or loamy sand
Clay content—2 to 12 percent
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

Bw horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 to 3 moist or dry
Reaction—slightly acid or moderately acid
Texture—loamy coarse sand, sandy loam, or loamy sand
Clay content—0 to 8 percent
Rock fragment content—15 to 60 percent total, including 15 to 60 percent gravel and 0 to 5 percent cobbles

C horizon:
Color—variegated mineral colors
Reaction—slightly acid or neutral
Texture—coarse sand, loamy sand, or loamy coarse sand
Clay content—0 to 5 percent
Rock fragment content—35 to 85 percent total, including 35 to 80 percent gravel and 0 to 15 percent cobbles

Semiahmoo Series

Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Capacity to transmit water (K_{sat}): Moderately high or high
Landscape: Drift plains
Landform: Depressions
Parent material: Highly decomposed plant material with a thin layer of volcanic ash mixed with diatomaceous earth
Slope range: 0 to 2 percent
Elevation: 0 to 450 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Euic, mesic Typic Haplosaprists

Typical Pedon

Semiahmoo muck in the soil survey of San Juan County, Washington; 1,000 feet west and 450 feet north of the southeast corner of section 15, T. 35 N., R. 3 W.; Willamette Baseline Meridian; False Bay, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 31 minutes 22 seconds north and longitude 123 degrees 2 minutes 37 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oa1—0 to 9 inches; black (5YR 2/1) muck, very dark gray (5YR 3/1) dry; about 12 percent fiber, 3 percent rubbed; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine tubular pores; moderately acid (pH 5.6); clear wavy boundary.

C—9 to 10 inches; light gray (N 7/0) silt loam, white (N 8/0) dry; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots in cracks; common very fine tubular pores; moderately acid (pH 5.6); abrupt smooth boundary.

Oa2—10 to 30 inches; black (5YR 2/1) muck, very dusky red (2.5YR 2/2) dry; about 60 percent fiber, 12 percent rubbed; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few very fine tubular pores; moderately acid (pH 5.6); gradual wavy boundary.

Oa3—30 to 48 inches; dark reddish brown (5YR 2/2) muck, dark reddish brown (5YR 3/2) dry; about 40 percent fiber, 10 percent rubbed; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; few fine roots; few very fine tubular pores; strongly acid (pH 5.3); gradual wavy boundary.

Oa4—48 to 60 inches; black (5YR 2/1) muck, dark reddish brown (5YR 2/2) dry; about 60 percent fiber, 12 percent rubbed; massive; hard, very friable, nonsticky and nonplastic; few fine roots; few very fine tubular pores; neutral (pH 6.6); gradual wavy boundary.

Oe1—60 to 72 inches; dark reddish brown (5YR 3/3) mucky peat, black (5YR 2/1) dry; about 70 percent fiber, 20 percent rubbed; massive; hard, very friable, nonsticky and nonplastic; neutral (pH 7.0); gradual wavy boundary.

Oe2—72 to 84 inches; dark reddish brown (5YR 3/2) mucky peat, black (5YR 2/1) dry; about 70 percent fiber, 20 percent rubbed; massive; hard, very friable, nonsticky and nonplastic; slightly alkaline (pH 7.6).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Depth to mineral soil: More than 51 inches

Oa horizon:
Hue—2.5YR to 10YR
Value—2 to 3 moist, 2 to 4 dry
Chroma—1 or 2 moist or dry
Fiber content—12 to 60 percent unrubbed, 3 to 13 percent rubbed
Reaction—strongly acid to neutral

C horizon:
Value—7 or 8 moist or dry
Texture—silt loam, very fine sandy loam, or fine sandy loam

Oe horizon:
Hue—5YR to 10YR
Value—2 to 3 moist, 1 or 2 dry
Chroma—2 or 3 moist, 1 or 2 dry
Fiber content—60 to 80 percent unrubbed, 17 to 50 percent rubbed
Reaction—neutral or slightly alkaline

Shalcar Series

Depth class: Very deep (more than 60 inches)
Drainage class: Very poorly drained
Capacity to transmit water (K_{sat}): Moderately high to very high
Landscape: Drift plains
Landform: Depressions
Parent material: Highly decomposed plant material over glacial outwash or dense glaciomarine deposits
Slope range: 0 to 2 percent
Elevation: 0 to 540 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy, mixed, euic, mesic Terric Haplosaprists

Typical Pedon

Shalcar muck in the soil survey of San Juan County, Washington; 1,650 feet south and 100 feet east of the northwest corner of section 3, T. 35 N., R. 3 W.; Willamette Baseline Meridian; Friday Harbor, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 33 minutes 39 seconds north and longitude 123 degrees 3 minutes 40 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oa1—0 to 3 inches; black (10YR 2/1) muck, black (10YR 2/1) dry; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; 15 percent fiber, 3 percent rubbed; many very fine, fine, medium, and coarse roots; many very fine and fine irregular pores; strongly acid (pH 5.2); clear smooth boundary.

Oa2—3 to 11 inches; black (10YR 2/1) muck, black (10YR 2/1) dry; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; 30 percent fiber, 5 percent rubbed; many very fine, fine, and medium roots; many very fine and fine irregular pores; slightly acid (pH 6.2); clear smooth boundary.

Oa3—11 to 22 inches; black (10YR 2/1) muck, black (10YR 2/1) dry; weak medium platy structure; soft, very friable, nonsticky and nonplastic; 20 percent fiber, 5 percent rubbed; many very fine and fine roots; many very fine and fine irregular pores; 5 percent medium distinct irregular dark yellowish brown (10YR 4/6) iron-manganese masses, yellowish brown (10YR 5/6) dry, with diffuse boundaries throughout and 5 percent medium faint irregular dark gray (10YR 4/1) iron depletions, light gray (10YR 7/1) dry, with diffuse boundaries throughout; slightly acid (pH 6.3); abrupt smooth boundary.

2Bg1—22 to 27 inches; gray (10YR 5/1) fine sandy loam, gray (10YR 6/1) dry; massive; soft, very friable, nonsticky and nonplastic; many very fine tubular pores; 15 percent medium distinct irregular dark yellowish brown (10YR 4/6) iron-manganese masses, yellowish brown (10YR 5/6) dry, with diffuse boundaries throughout and 15 percent medium distinct irregular iron depletions with diffuse boundaries throughout; neutral (pH 7.3); gradual wavy boundary.

2Bg2—27 to 44 inches; gray (10YR 5/1) silt loam, gray (10YR 6/1) dry; massive; soft, very friable, slightly sticky and slightly plastic; many very fine tubular pores; 15 percent medium distinct irregular iron depletions with diffuse boundaries throughout and 20 percent medium distinct irregular dark yellowish brown (10YR 4/6) iron-manganese masses, yellowish brown (10YR 5/6) dry, with diffuse boundaries throughout; slightly alkaline (pH 7.8); gradual wavy boundary.

2Cg—44 to 60 inches; gray (10YR 5/1) sandy loam, gray (10YR 6/1) dry; massive; soft, very friable, slightly sticky and slightly plastic; few very fine irregular pores; moderately alkaline (pH 8.1).

Range in Characteristics

Depth to restrictive feature: 16 to 51 inches to strongly contrasting textural stratification
Mean annual soil temperature: 50 to 52 degrees F
Depth to mineral soil: 16 to 51 inches
Fiber content: 5 to 40 percent, 2 to 15 percent rubbed

Oa horizon:
Hue—10YR to 2.5Y, or neutral
Value—2 to 3 moist or dry
Chroma—1 or 3 moist or dry
Reaction—strongly acid to slightly acid

2Bg horizon:
Hue—10YR to 5Y, 5GY, or neutral
Value—4 to 6 moist, 5 to 7 dry
Chroma—1 or 2 moist or dry
Reaction—neutral or slightly alkaline
Texture—fine sandy loam, silt loam, loam, sandy loam, or sand
Rock fragment content—0 to 5 percent gravel

2Cg horizon:
Hue—10YR, 5Y, 5GY, or neutral
Value—4 or 5 moist, 5 to 7 dry
Chroma—1 or 2 moist or dry
Reaction—neutral to moderately alkaline
Texture—sandy loam, loam, or silt loam
Rock fragment content—0 to 5 percent gravel

Sholander Series

Depth class: Deep to dense material
Drainage class: Somewhat poorly drained
Capacity to transmit water (K_{sat}): Very low to very high
Landscape: Drift plains
Landform: Valleys
Parent material: Glacial outwash over dense glaciomarine deposits
Slope range: 2 to 12 percent
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy, isotic, mesic Aquic Dystroxerepts

Typical Pedon

Sholander gravelly loam in an area of Sholander, cool-Spieden complex, 0 to 5 percent slopes; 600 feet north and 1,800 feet east of the southwest corner of section 9, T. 34 N., R. 1 W.; Willamette Baseline Meridian; Lopez Pass, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 27 minutes 3 seconds north and longitude 122 degrees 48 minutes 56 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A—0 to 8 inches; very dark grayish brown (10YR 3/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many

very fine and fine irregular pores; 10 percent gravel, 5 percent cobbles, and 5 percent stones; moderately acid (pH 5.9); clear wavy boundary.

E—8 to 16 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate coarse subangular blocky structure; moderately hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine irregular pores; 10 percent iron depletions that are light brownish gray (10YR 6/2) moist and are in matrix and 15 percent prominent iron-manganese masses that are dark yellowish brown (10YR 4/6) moist and are throughout; 20 percent gravel, 5 percent cobbles, and 5 percent stones; moderately acid (pH 5.9); abrupt smooth boundary.

Bg1—16 to 28 inches; brown (10YR 5/3) gravelly loamy sand, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine irregular pores; many very fine and fine interstitial pores; 15 percent iron-manganese masses that are dark yellowish brown (10YR 4/6) moist and are throughout and 35 percent iron depletions that are light brownish gray (10YR 6/2) moist and are in matrix; 20 percent gravel, 5 percent cobbles, and 5 percent stones; moderately acid (pH 5.9); gradual wavy boundary.

Bg2—28 to 51 inches; brown (10YR 5/3) gravelly sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; 15 percent iron-manganese masses that are dark yellowish brown (10YR 4/6) moist and are throughout and 20 percent iron depletions that are light brownish gray (10YR 6/2) moist and are in matrix; 15 percent gravel; moderately acid (pH 5.9); gradual wavy boundary.

2Cd—51 to 60 inches; light gray (10YR 7/1) loam, gray (10YR 5/1) moist; massive; common prominent iron masses that are strong brown (7.5YR 4/6) moist and are throughout; 10 percent gravel; slightly acid (pH 6.4).

Range in Characteristics

Depth to restrictive feature: 40 to 60 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Depth to redoximorphic features: 8 to 18 inches
Reaction: Moderately acid or slightly acid
Particle-size control section: Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

A horizon:
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—8 to 16 percent

E horizon:
Value—4 or 5 moist, 6 or 7 dry
Chroma—1 or 2 moist or dry
Texture—sandy loam or loamy sand
Clay content—0 to 8 percent
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

Bg horizon:
Value—3 or 4 moist, 5 or 6 dry
Chroma—2 to 4 moist or dry
Texture—sand or loamy sand
Clay content—0 to 8 percent
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

2Cd horizon:
Hue—10YR to 2.5Y
Value—5 or 6 moist, 4 to 7 dry
Chroma—2 or 3 moist or dry
Texture—loam or sandy loam
Clay content—8 to 15 percent
Rock fragment content—0 to 35 percent gravel

Snakelum Series

Depth class: Very deep (more than 60 inches)
Drainage class: Somewhat excessively drained
Capacity to transmit water (K_{sat}): High or very high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Compact glacial outwash
Slope range: 0 to 2 percent
Elevation: 150 to 220 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy, isotic, mesic Ultic Haploxerolls

Typical Pedon

Snakelum coarse sandy loam in an area of Snakelum-San Juan complex, 0 to 2 percent slopes; 660 feet north and 1,575 feet west of the southeast corner of section 1, T. 31 N., R. 1 E.; Willamette Baseline Meridian; Coupeville, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 11 minutes 51 seconds north and longitude 122 degrees 37 minutes 20 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A—0 to 10 inches; very dark brown (10YR 2/2) coarse sandy loam, black (10YR 2/1) moist; moderate fine granular structure; slightly hard, friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many fine and medium tubular pores; moderately acid (pH 5.9); abrupt smooth boundary.

AB—10 to 18 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; hard, firm, nonsticky and nonplastic; common very fine and fine roots; many fine and medium tubular pores; moderately acid (pH 5.9); clear smooth boundary.

Bw—18 to 24 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; hard, very firm, nonsticky and nonplastic; few very fine roots; common fine irregular pores; moderately acid (pH 6.0); clear smooth boundary.

2BC—24 to 48 inches; light brownish gray (10YR 6/2) loamy coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; many fine interstitial pores; slightly acid (pH 6.4); gradual smooth boundary.

2C—48 to 60 inches; light yellowish brown (2.5Y 6/3) coarse sand, olive brown (2.5Y 4/3) moist; single grain; loose, nonsticky and nonplastic; many fine and medium interstitial pores; 10 percent gravel; slightly acid (pH 6.4).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mollic epipedon thickness: 10 to 20 inches

Reaction: Slightly acid to strongly acid
Mean annual soil temperature: 50 to 52 degrees F
Particle-size control section: Clay content—2 to 15 percent; rock fragment content—0 to 5 percent gravel

A horizon:
Hue—10YR or 7.5YR
Value—2 to 4 dry, 1 or 2 moist
Chroma—1 or 2 moist or dry
Clay content—5 to 15 percent
Rock fragment content—0 to 15 percent gravel

AB horizon:
Hue—10YR or 7.5YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—2 or 3 moist or dry
Texture—sandy loam or fine sandy loam
Clay content—5 to 15 percent
Rock fragment content—0 to 15 percent gravel

Bw horizon:
Hue—10YR or 7.5YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 or 3 moist or dry
Texture—sandy loam or fine sandy loam
Clay content—5 to 15 percent
Rock fragment content—0 to 35 percent gravel

2BC horizon:
Hue—10YR or 7.5YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—2 or 3 moist or dry
Texture—loamy coarse sand or loamy sand
Clay content—2 to 6 percent
Rock fragment content—0 to 35 percent gravel

2C horizon:
Hue—2.5Y or 10YR
Value—4 to 7 dry, 4 to 6 moist
Chroma—1 to 3 moist or dry
Texture—coarse sand or loamy coarse sand
Clay content—2 to 5 percent
Rock fragment content—0 to 50 percent gravel

Spieden Series

Depth class: Very deep (more than 60 inches)
Drainage class: Poorly drained
Capacity to transmit water (K_{sat}): Moderately high to very high
Landscape: Drift plains
Landform: Drainageways
Parent material: Glacial outwash
Slope range: 0 to 2 percent
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches

Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy, isotic, mesic Typic Endoaquolls

Typical Pedon

Spieden mucky silt loam in the soil survey of San Juan County, Washington; 1,250 feet north and 900 feet west of the southeast corner of section 2, T. 34 N., R. 3 W.; Willamette Baseline Meridian; False Bay, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 28 minutes 1 second north and longitude 123 degrees 1 minute 16 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

A1—0 to 4 inches; black (10YR 2/1) mucky silt loam, gray (10YR 5/1) dry; weak fine subangular blocky structure parting to moderate fine granular; soft, very friable, slightly sticky and moderately plastic; many very fine and fine roots; many fine interstitial and common very fine and fine irregular pores; 10 percent gravel; moderately acid (pH 5.8); clear wavy boundary.

A2—4 to 11 inches; black (10YR 2/1) silt loam, gray (10YR 5/1) dry; weak fine subangular blocky structure parting to moderate fine granular structure; soft, very friable, slightly sticky and moderately plastic; few very fine and fine roots; common very fine interstitial and few very fine irregular pores; 5 percent coarse irregular very weakly cemented iron-manganese masses in matrix; 10 percent gravel; slightly acid (pH 6.3); abrupt wavy boundary.

E—11 to 24 inches; dark grayish brown (2.5Y 4/2) gravelly loamy sand, light brownish gray (2.5Y 6/2) dry; single grain; loose, nonsticky and nonplastic; few very fine interstitial pores; 75 percent coarse irregular very weakly cemented iron-manganese masses in matrix with diffuse boundaries; 15 percent gravel; neutral (pH 6.7); clear wavy boundary.

Bg—24 to 36 inches; dark olive brown (2.5Y 3/3) gravelly loamy coarse sand, light yellowish brown (2.5Y 6/3) dry; single grain; loose, nonsticky and nonplastic; few very fine interstitial pores; 75 percent coarse prominent irregular very weakly cemented iron-manganese masses in matrix with diffuse boundaries; 15 percent gravel; neutral (pH 6.7); clear wavy boundary.

C1—36 to 48 inches; dark olive brown (2.5Y 3/3) coarse sand, light yellowish brown (2.5Y 6/3) dry; single grain; loose, nonsticky and nonplastic; few very fine interstitial pores; 10 percent gravel; neutral (pH 6.9); clear wavy boundary.

C2—48 to 60 inches; very dark grayish brown (2.5Y 3/2) coarse sand, light brownish gray (2.5Y 6/2) dry; single grain; loose, nonsticky and nonplastic; few very fine interstitial pores; 10 percent gravel; neutral (pH 6.9).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Mollic epipedon thickness: 10 to 14 inches
Depth to redoximorphic features: 0 to 8 inches
Reaction: Moderately acid to neutral
Particle-size control section: Clay content—0 to 5 percent; rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

A1 horizon:
Value—2 or 3 moist, 3 to 5 dry
Chroma—1 or 2 moist or dry
Clay content—6 to 18 percent
Rock fragment content—0 to 15 percent gravel

A2 horizon:
Value—2 or 3 moist, 3 to 5 dry
Chroma—1 or 2 moist or dry
Texture—silt loam or loam
Clay content—6 to 18 percent
Rock fragment content—0 to 20 percent total, including 0 to 15 percent gravel and 0 to 5 percent cobbles

E horizon:
Hue—7.5YR to 2.5Y
Value—3 or 4 moist, 5 or 6 dry
Chroma—1 or 2 moist or dry
Texture—loamy sand or sand
Clay content—0 to 5 percent
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

Bg horizon:
Hue—7.5YR to 2.5Y
Value—3 or 4 moist, 5 or 6 dry
Chroma—2 to 4 moist or dry
Texture—loamy coarse sand, loamy sand, or sand
Clay content—0 to 5 percent
Rock fragments—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

C horizon:
Hue—7.5YR to 2.5Y
Value—5 or 6 moist, 4 to 7 dry
Chroma—2 or 3 moist or dry
Texture—coarse sand, loamy sand, or sand
Clay content—0 to 5 percent
Rock fragment content—0 to 15 percent total, including 0 to 15 percent gravel and 0 to 5 percent cobbles

Sucia Series

Depth class: Moderately deep to dense material
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Moderately high to very high
Landscape: Drift plains
Landform: Valleys
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 15 percent
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Fine-loamy, mixed, superactive, mesic Aquultic Haploxeralfs

Typical Pedon

Sucia loamy sand in the soil survey of San Juan County, Washington; 100 feet north and 1,100 feet west of the southeast corner of section 13, T. 36 N., R. 4 W.; Willamette Baseline Meridian; Roche Harbor, Washington, U.S. Geological Survey quadrangle;

latitude 48 degrees 36 minutes 33 seconds north and longitude 123 degrees 7 minutes 53 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A—0 to 8 inches; dark grayish brown (10YR 4/2) loamy sand, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine irregular and interstitial pores; strongly acid (pH 5.5); abrupt smooth boundary.

Bw—8 to 17 inches; yellowish brown (10YR 5/4) loamy sand, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; few very fine and fine irregular, common fine tubular, and many medium interstitial pores; moderately acid (pH 6.0); clear wavy boundary.

E—17 to 31 inches; gray (10YR 6/1) gravelly loamy sand, dark gray (10YR 4/1) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial pores; 30 percent prominent light brown (7.5YR 6/4) iron-manganese masses, brown (7.5YR 5/4) moist; 10 percent gravel and 5 percent cobbles; moderately acid (pH 6.0); gradual wavy boundary.

2Btg—31 to 38 inches; olive brown (2.5Y 4/4) loam, light olive brown (2.5Y 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and common very fine roots in cracks; many very fine and fine tubular pores; 20 percent prominent strong brown (7.5YR 5/8) iron-manganese masses, strong brown (7.5YR 4/6) moist, and 40 percent prominent light gray (10YR 7/2) iron depletions, gray (10YR 6/1) moist; slightly acid (pH 6.4); abrupt wavy boundary.

2Cd—38 to 60 inches; weak red (2.5YR 5/2) silt loam, pale red (2.5YR 6/2) moist; massive; hard, firm, slightly sticky and slightly plastic; 10 percent prominent light gray (10YR 7/2) iron depletions, gray (10YR 6/1) moist, in cracks; neutral (pH 7.3).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Depth to redoximorphic features: 16 to 27 inches
Reaction: Strongly acid to neutral
Particle-size control section: Clay content—18 to 35 percent; rock fragment content—0 to 35 percent total, including 0 to 30 percent gravel and 0 to 10 percent cobbles

A horizon:
Value—3 or 4 moist, 4 or 5 dry
Chroma—1 or 2 moist or dry
Clay content—2 to 8 percent

Bw horizon:
Value—4 or 5 moist, 5 or 6 dry
Chroma—3 or 4 moist or dry
Texture—sand or loamy sand
Clay content—0 to 5 percent
Rock fragment content—0 to 35 percent total, including 0 to 25 percent gravel and 0 to 10 percent cobbles

E horizon:
Hue—10YR or 7.5YR
Value—4 or 5 moist, 5 or 6 dry
Chroma—1 or 2 moist or dry
Texture—sand or loamy sand
Clay content—0 to 5 percent

Rock fragment content—0 to 15 percent total, including 0 to 15 percent gravel and 0 to 10 percent cobbles

2Btg horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—4 or 5 moist, 5 or 6 dry
Chroma—3 or 4 moist or dry
Texture—loam, clay loam, or sandy clay loam
Clay content—18 to 35 percent
Rock fragment content—0 to 15 percent gravel

2Cd horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—4 to 6 moist, 5 to 7 dry
Chroma—1 or 2 moist or dry
Texture—silt loam, loam, or sandy loam
Clay content—18 to 35 percent
Rock fragment content—0 to 15 percent gravel

Townsend Series

Depth class: Moderately deep to dense material
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Glacial drift over dense glacial drift
Slope range: 3 to 15 percent
Elevation: 0 to 200 feet
Mean annual precipitation: 20 to 25 inches
Mean annual air temperature: 50 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy-skeletal, isotic, mesic Aquultic Haploxerolls

Typical Pedon

Townsend gravelly loam in the soil survey of Jefferson County Area, Washington; 1,540 feet west and 820 feet south of the northeast corner of section 11, T. 30 N., R. 1 W.; Willamette Baseline Meridian; Port Townsend South, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 6 minutes 43 seconds north and longitude 122 degrees 45 minutes 46 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A1—0 to 5 inches; very dark gray (5YR 3/1) gravelly loam, black (5YR 2/1) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots; many fine and medium irregular pores; 5 percent fine gravel and 15 percent gravel; slightly acid (pH 6.4); abrupt wavy boundary.

A2—5 to 18 inches; very dark gray (5YR 3/1) very gravelly loam, black (5YR 2/1) moist; weak medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many fine and medium roots; many fine and medium irregular pores; 10 percent fine gravel and 30 percent gravel; slightly acid (pH 6.3); clear wavy boundary.

AB—18 to 24 inches; dark gray (10YR 4/1) very gravelly sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, firm,

slightly sticky and slightly plastic; common fine and few medium roots; common fine and medium tubular pores; 10 percent fine gravel and 30 percent gravel; slightly acid (pH 6.2); clear wavy boundary.

2Bg—24 to 36 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, firm, nonsticky and nonplastic; few very fine and fine roots; common fine and medium irregular pores; 5 percent medium faint light gray (10YR 7/2) iron depletions, grayish brown (10YR 5/2) moist, with clear boundaries lining pores and 15 percent medium prominent reddish yellow (5YR 6/6) masses of oxidized iron, yellowish red (5YR 4/6) moist, with clear boundaries; 10 percent fine gravel, 25 percent gravel, and 10 percent cobbles; slightly acid (pH 6.4); gradual irregular boundary.

2Cd—36 to 60 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, grayish brown (10YR 5/2) moist; massive; very hard, very firm, nonsticky and nonplastic; few very fine roots in cracks; few very fine and fine irregular pores; 5 percent medium distinct light gray (10YR 7/2) iron depletions, grayish brown (10YR 5/2) moist, with clear boundaries lining pores and 10 percent medium distinct light reddish brown (5YR 6/4) masses of oxidized iron, yellowish red (5YR 4/6) moist, with clear boundaries; 15 percent fine gravel and 30 percent gravel; slightly acid (pH 6.4).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Depth to redoximorphic features: 19 to 40 inches
Mollic epipedon thickness: 10 to 24 inches
Reaction: Moderately acid to neutral
Mean annual soil temperature: 50 to 52 degrees F
Particle-size control section: Clay content—2 to 15 percent; rock fragment content—35 to 65 percent total, including 35 to 70 percent gravel and 0 to 15 percent cobbles

A1 horizon:
Hue—5YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—7 to 15 percent
Rock fragment content—15 to 35 percent gravel

A2 horizon:
Hue—5YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—loam or sandy loam
Clay content—5 to 15 percent
Rock fragment content—35 to 60 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

AB horizon:
Hue—10YR or 7.5YR
Value—2 to 4 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—sandy loam or loam
Clay content—5 to 15 percent
Rock fragment content—35 to 60 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

2Bg horizon:
Hue—10YR or 7.5YR
Value—4 to 6 moist, 5 or 6 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam, loamy sand, or loam
Clay content—2 to 12 percent
Rock fragment content—35 to 70 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

2Cd horizon:
Hue—10YR or 7.5YR
Value—4 to 6 moist, 5 or 6 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam or loam
Clay content—2 to 15 percent
Rock fragment content—20 to 60 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

Uselessbay Series

Depth class: Moderately deep to dense material
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Very low to very high
Landscape: Drift plains
Landform: Ridges
Parent material: Glacial outwash
Slope range: 0 to 15 percent
Elevation: 0 to 520 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Sandy, isotic, mesic Oxyaquic Dystroxerepts

Typical Pedon

Uselessbay gravelly sandy loam in an area of Uselessbay-Utsalady complex, 0 to 10 percent slopes; 400 feet west and 570 feet south of the northeast corner of section 15, T. 29 N., R. 5 W.; Willamette Baseline Meridian; Langley SE, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 0 minutes 16 seconds north and longitude 122 degrees 23 minutes 53 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oi—0 to 2 inches; slightly decomposed needles, leaves, and twigs; abrupt smooth boundary.
A—2 to 3 inches; black (10YR 2/1) gravelly sandy loam, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure parting to weak very fine granular; soft, very friable, nonsticky and nonplastic; many very fine to coarse roots; many very fine and fine and common medium tubular pores; 15 percent gravel and 2 percent cobbles; strongly acid (pH 5.5); abrupt smooth boundary.
Bw1—3 to 9 inches; dark yellowish brown (10YR 3/4) gravelly sandy loam, yellowish brown (10YR 5/6) dry; moderate fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine to coarse roots; common very fine to medium tubular pores; 15 percent gravel and 2 percent cobbles; medium acid (pH 5.6); clear wavy boundary.

Bw2—9 to 15 inches; dark yellowish brown (10YR 4/4) gravelly loamy sand, yellowish brown (10YR 5/6) dry; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium and coarse roots; common very fine irregular pores; 15 percent gravel and 2 percent cobbles; medium acid (pH 5.6); clear wavy boundary.

C—15 to 34 inches; olive brown (2.5Y 4/3) gravelly sand, light brownish gray (2.5Y 6/2) dry; single grain; loose, nonsticky and nonplastic; common fine to coarse roots; common very fine irregular pores; 25 percent gravel and 2 percent cobbles; medium acid (pH 5.9); clear wavy boundary.

Cg—34 to 37 inches; olive brown (2.5Y 4/3) gravelly sand, light brownish gray (2.5Y 6/2) dry; single grain; loose, nonsticky and nonplastic; common medium and coarse roots; common very fine irregular pores; common fine and medium distinct yellowish brown (10YR 5/6) iron-manganese masses, yellow (10YR 7/6) dry; common fine distinct light brownish gray (10YR 6/2) iron depletions, light gray (10YR 7/2) dry; 25 percent gravel and 2 percent cobbles; slightly acid (pH 6.3); clear wavy boundary.

Cd—37 to 60 inches; grayish brown (2.5Y 5/2) gravelly sandy loam, light gray (2.5Y 7/2) dry; massive; very hard, firm, nonsticky and nonplastic; very few very fine roots in cracks; few fine irregular pores; few coarse distinct dark yellowish brown (10YR 4/6) iron-manganese masses, brownish yellow (10YR 6/6) dry, in seams; 15 percent gravel; slightly acid (pH 6.5).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to densic material
Depth to redoximorphic features: 30 to 40 inches
Reaction: Medium acid or slightly acid
Particle-size control section: Clay content—1 to 5 percent; rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

A horizon:
Value—2 or 3 moist, 2 to 4 dry
Chroma—1 or 2 moist or dry
Rock fragment content—15 to 35 percent gravel

Bw horizon:
Hue—10YR or 2.5Y
Value—3 or 4 moist, 5 or 6 dry
Chroma—4 or 5 moist, 5 or 6 dry
Texture—loamy sand, sandy loam, or loam
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

C horizon:
Value—4 or 5 moist, 6 or 7 dry
Chroma—2, 3, or 4 moist or dry
Texture—sand or loamy sand
Rock fragment content—0 to 35 percent gravel

Cg horizon:
Value—4 or 5 moist, 6 or 7 dry
Chroma—2, 3, or 4 moist or dry
Texture—sand or loamy sand
Rock fragment content—0 to 35 percent gravel
Redoximorphic features—few to common, fine or medium, soft, iron-manganese masses and common fine iron depletions

Cd horizon:
Hue—2.5Y or 5Y
Value—4 to 6 moist, 7 or 8 dry
Texture—loam or sandy loam
Rock fragment content—0 to 35 percent gravel

Utsalady Series

Depth class: Very deep (more than 60 inches)
Drainage class: Well drained
Capacity to transmit water (K_{sat}): Very high
Landscape: Drift plains
Landform: Ridges
Parent material: Glacial outwash
Slope range: 0 to 15 percent
Elevation: 0 to 520 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Isotic, mesic Oxyaquic Xeropsamments

Typical Pedon

Utsalady loamy sand in an area of Utsalady-Uselessbay complex, 2 to 12 percent slopes; 2,138 feet west and 2,010 feet south of the northeast corner of section 9, T. 29 N., R. 5 W.; Willamette Baseline Meridian; Langley SE, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 0 minutes 57 seconds north and longitude 122 degrees 25 minutes 38 seconds west; NAD 83. (Colors are for moist soil unless otherwise noted.)

Oi—0 to 1 inch; slightly decomposed needles, leaves, and twigs.

E—1 to 2 inches; gray (2.5Y 6/1) loamy sand, light gray (2.5Y 7/1) dry; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine irregular pores; medium acid (pH 5.6); abrupt irregular boundary.

Bw1—2 to 15 inches; dark yellowish brown (10YR 4/6) loamy sand, yellowish brown (10YR 5/6) dry; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and few very fine roots; common fine irregular and tubular pores; medium acid (pH 5.7); gradual wavy boundary.

Bw2—15 to 31 inches; olive brown (2.5Y 4/4) loamy sand, light olive brown (2.5Y 5/4) dry; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; common very fine irregular and few fine interstitial pores; 15 percent gravel and 2 percent cobbles; medium acid (pH 5.7); abrupt wavy boundary.

Bg—31 to 42 inches; dark grayish brown (2.5Y 4/2) loamy sand, grayish brown (2.5Y 5/2) dry; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; common fine irregular pores; common medium brown (10YR 4/3) iron-manganese concentrations, yellowish brown (10YR 5/4) dry, and common medium light gray (2.5Y 7/1) iron depletions, light gray (10YR 7/2) dry; medium acid (pH 5.7); abrupt wavy boundary.

C—42 to 50 inches; dark grayish brown (2.5Y 4/2) sand, grayish brown (2.5Y 5/2) dry; single grain; loose, nonsticky and nonplastic; few medium roots; few very fine interstitial pores; medium acid (pH 6.0); abrupt wavy boundary.

Cg1—50 to 55 inches; dark grayish brown (2.5Y 4/2) loamy sand, grayish brown (2.5Y 5/2) dry; moderate medium subangular blocky structure; slightly hard, very friable,

nonsticky and nonplastic; common very fine irregular pores; very few fine brown (10YR 4/3) iron-manganese concentrations, yellowish brown (10YR 5/4) dry, and very few fine light gray (2.5Y 7/1) iron depletions, light gray (2.5Y 7/2) dry; medium acid (pH 6.0); abrupt wavy boundary.

Cg2—55 to 60 inches; variegated sand; single grain; loose, nonsticky and nonplastic; few very fine interstitial pores; very few fine brown (10YR 4/3) iron-manganese concentrations, yellowish brown (10YR 5/4) dry, and very few fine light gray (2.5Y 7/1) iron depletions, light gray (10YR 7/2) dry; medium acid (pH 6.0).

Range in Characteristics

Depth to redoximorphic features: 30 to 40 inches (may not be present in all pedons)
Reaction: Medium acid or slightly acid
Particle-size control section: Clay content—1 to 5 percent; rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

Bw horizon:
Hue—10YR or 2.5Y
Value—3 or 4 moist, 5 or 6 dry
Chroma—4 or 5 moist, 5 or 6 dry
Texture—loamy sand or sand
Rock fragment content—0 to 35 percent total, including 0 to 35 percent gravel and 0 to 5 percent cobbles

C horizon:
Value—4 or 5 moist, 5 to 7 moist
Chroma—2, 3, or 4 moist or dry
Texture—sand or loamy sand
Rock fragment content—0 to 35 percent gravel and 0 to 5 percent cobbles

Cg horizon:
Value—4 or 5 moist, 5 to 7 moist
Chroma—2, 3, or 4 moist or dry
Texture—sand or loamy sand
Rock fragment content—0 to 35 percent gravel and 0 to 5 percent cobbles
Redoximorphic features—very few to common, fine or medium, soft, iron-manganese masses

Whidbey Series

Depth class: Moderately deep to dense material
Drainage class: Moderately well drained
Capacity to transmit water (K_{sat}): Very low to very high
Landscape: Hills, drift plains
Landform: Hillslopes
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 2 to 15 percent
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Loamy-skeletal, isotic, mesic Aquic Dystroxerepts

Typical Pedon

Whidbey gravelly loam in the soil survey of San Juan County, Washington; 2,400 feet north and 2,000 feet east of the southwest corner of section 23, T. 35 N.,

R. 2 W.; Willamette Baseline Meridian; Shaw Island, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 30 minutes 49 seconds north and longitude 122 degrees 54 minutes 6 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

Oi—0 to 2 inches; slightly decomposed plant material; abrupt smooth boundary.

A—2 to 6 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine, common very fine, and few medium and coarse roots; many very fine and fine irregular pores; 15 percent gravel and 10 percent cobbles; moderately acid (pH 5.7); clear wavy boundary.

Bw—6 to 20 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots and few coarse roots; common very fine and fine interstitial and irregular pores; 45 percent gravel and 5 percent cobbles; moderately acid (pH 5.7); clear wavy boundary.

Bg—20 to 37 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few very fine and fine roots between peds; common very fine and fine interstitial and irregular pores; 15 percent distinct weakly cemented iron depletions that are light brownish gray (10YR 6/2) moist and in matrix and 25 percent distinct weakly cemented iron-manganese concentrations that are yellowish brown (10YR 5/6) moist and in matrix; 45 percent gravel and 5 percent cobbles; slightly acid (pH 6.2); abrupt wavy boundary.

2Cd—37 to 60 inches; light olive brown (2.5Y 5/3) gravelly sandy loam, olive brown (2.5Y 4/3) moist; massive; hard, firm, nonsticky and nonplastic; few very fine irregular pores; 5 percent distinct weakly cemented iron-manganese concentrations that are yellowish brown (10YR 5/6) moist and in matrix and 5 percent distinct weakly cemented iron depletions that are light brownish gray (10YR 6/2) moist and in matrix; 25 percent gravel; neutral (pH 6.9).

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Mean annual soil temperature: 50 to 52 degrees F
Depth to redoximorphic features: 18 to 30 inches
Reaction: Moderately acid to neutral
Particle-size control section: Clay content—4 to 18 percent; rock fragment content—35 to 70 percent total, including 35 to 70 percent gravel, 0 to 20 percent cobbles, and 0 to 5 percent stones

A horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 4 or 5 dry
Chroma—2 or 3 moist or dry
Rock fragment content—15 to 35 percent total, including 15 to 35 percent gravel, 0 to 20 percent cobbles, and 0 to 5 percent stones

Bw horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—3 to 5 moist, 4 to 6 dry
Chroma—3 or 4 moist or dry
Texture—loam, sandy loam, or coarse sandy loam
Clay content—4 to 15 percent
Rock fragment content—35 to 70 percent total, including 10 to 50 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

Bg horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 5 or 6 dry
Chroma—3 or 4 moist or dry
Texture—sandy loam or loamy sand
Clay content—5 to 18 percent
Rock fragment content—35 to 65 percent total, including 10 to 50 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Cd horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6 moist, 5 to 7 dry
Chroma—2 or 3 moist or dry
Texture—sandy loam, sandy clay loam, or coarse sandy loam
Clay content—9 to 24 percent
Rock fragment content—10 to 45 percent total, including 10 to 30 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Xerorthents

Depth class: Very deep (more than 60 inches)
Drainage class: Excessively drained
Capacity to transmit water (K_{sat}): Very high
Landscape: Shore complexes
Landform: Beaches, hillslopes, sea cliffs
Parent material: Beach sand and colluvium derived from glacial outwash
Slope range: 0 to 100 percent
Elevation: 0 to 250 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Xerorthents

Typical Pedon

Xerorthents very gravelly sand in the soil survey of San Juan County, Washington; 2,900 feet south and 450 feet east of the northwest corner of section 7, T. 34 N., R. 2 W.; Willamette Baseline Meridian; Richardson, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 27 minutes 20 seconds north and longitude 122 degrees 59 minutes 38 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A—0 to 1 inch; dark grayish brown (10YR 4/2) very gravelly sand, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine roots and few medium roots; many fine and medium interstitial pores; 50 percent gravel and 10 percent cobbles; moderately acid (pH 5.7); abrupt smooth boundary.
C1—1 to 20 inches; stratified extremely gravelly coarse sand to very gravelly sand; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; many fine and medium interstitial pores; 50 percent gravel and 10 percent cobbles; slightly acid (pH 6.4); clear wavy boundary.
C2—20 to 60 inches; stratified very gravelly sand; single grain; loose, nonsticky and nonplastic; many fine and medium interstitial pores; 50 percent gravel and 10 percent cobbles; neutral (pH 6.8).

Range in Characteristics

Depth to restrictive feature: More than 60 inches
Mean annual soil temperature: 50 to 52 degrees F
Reaction: Moderately acid to neutral
Particle-size control section: Clay content—0 to 3 percent; rock fragment content—35 to 80 percent total, including 35 to 80 percent gravel and 0 to 15 percent cobbles

A horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 4 to 6 dry
Chroma—1 to 3 moist or dry
Clay content—0 to 3 percent
Rock fragment content—35 to 80 percent total, including 35 to 80 percent gravel and 0 to 15 percent cobbles

C horizon:
Color—variegated parent material colors; 40 percent dark colors, 40 percent light colors, and 20 percent intermediate mineral colors
Reaction: Slightly acid or neutral
Texture: Coarse sand or sand
Clay content: 0 to 3 percent
Rock fragment content—35 to 80 percent total, including 35 to 80 percent gravel and 0 to 15 percent cobbles

Zylstra Series

Depth class: Moderately deep to dense material (fig. 24)
Drainage class: Somewhat poorly drained
Capacity to transmit water (K_{sat}): Very low to high
Landscape: Drift plains
Landform: Hillslopes
Parent material: Glacial drift over dense glaciomarine deposits
Slope range: 0 to 12 percent
Elevation: 0 to 590 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 48 to 50 degrees F
Frost-free period: 200 to 240 days

Taxonomic class: Coarse-loamy, isotic, mesic Aquic Dystroxerepts

Typical Pedon

Zylstra loam in an area of Zylstra-Mitchellbay complex, 0 to 5 percent slopes; 900 feet east and 1,030 feet north of the southwest corner of section 60, T. 32 N., R. 1 E.; Willamette Baseline Meridian; Coupeville, Washington, U.S. Geological Survey quadrangle; latitude 48 degrees 14 minutes 32 seconds north and longitude 122 degrees 44 minutes 32 seconds west; NAD 83. (Colors are for dry soil unless otherwise noted.)

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium to coarse granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium and coarse roots; many medium irregular and interstitial pores; 5 percent gravel; clear smooth boundary.

Figure 24.—Typical profile of a Zylstra soil. This soil is similar to the Elwha soil except that the Zylstra soil is somewhat poorly drained and thus the redoximorphic features (red and orange stains) are at a shallower depth. The compacted dense horizon is at a depth of about 38 inches.

A2—4 to 12 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine irregular and interstitial pores; 5 percent fine gravel and 5 percent gravel; abrupt wavy boundary.

E—12 to 18 inches; light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine to medium roots; common very fine and fine irregular pores; 20 percent distinct yellowish brown (10YR 5/4) iron-manganese masses, dark yellowish brown (10YR 4/6) moist, in matrix and 60 percent distinct light gray (2.5Y 7/1) iron depletions, gray (2.5Y 5/1) moist, throughout with clear boundaries; 5 percent fine gravel and 5 percent gravel; clear wavy boundary.

Bg1—18 to 32 inches; light brownish gray (2.5Y 6/2) gravelly sandy loam, grayish brown (2.5Y 5/2) moist; moderate medium angular blocky structure; moderately hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine irregular pores; 25 percent faint light brownish gray (2.5Y 6/2) iron depletions, grayish brown (2.5Y 5/2) moist, in matrix and 25 percent distinct brown (7.5YR 5/4) iron-manganese masses, brown (7.5YR 4/4) moist, in matrix; 5 percent fine gravel and 10 percent gravel; gradual wavy boundary.

Bg2—32 to 37 inches; light brownish gray (2.5Y 6/2) gravelly loam, grayish brown (2.5Y 5/2) moist; strong coarse angular blocky structure; very hard, very firm, slightly sticky and slightly plastic; few very fine roots in cracks; many very fine irregular and interstitial pores; 15 percent prominent very dark gray (10YR 3/1) organoargillans, black (10YR 2/1) moist, on faces of peds; 25 percent coarse distinct reddish yellow (5YR 6/6) iron-manganese masses, yellowish red (5YR 4/6) moist, in matrix with clear boundaries and 75 percent coarse prominent light gray (2.5Y 7/1) iron depletions, gray (2.5Y 6/1) moist, in matrix with clear boundaries; 5 percent fine gravel and 15 percent gravel; gradual wavy boundary.

Cd—37 to 60 inches; light brownish gray (2.5Y 6/2) gravelly sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, nonsticky and nonplastic; few very fine irregular pores; 5 percent fine gravel and 10 percent gravel.

Range in Characteristics

Depth to restrictive feature: 20 to 40 inches to dense material
Depth to redoximorphic features: 9 to 18 inches
Umbric epipedon thickness: 10 to 12 inches
Reaction: Strongly acid to neutral
Mean annual soil temperature: 50 to 52 degrees F
Particle-size control section: Clay content—5 to 18 percent; rock fragment content—0 to 25 percent gravel and 0 to 10 percent cobbles

A1 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Clay content—5 to 10 percent

A2 horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 moist or dry
Texture—loam, fine sandy loam, or sandy loam

Clay content—5 to 10 percent
Rock fragment content—0 to 35 percent

E horizon:
Hue—10YR or 2.5Y
Value—4 to 5 moist, 6 or 7 dry
Chroma—1 or 2 moist or dry
Texture—sandy loam, fine sandy loam, or loam
Clay content—2 to 10 percent
Rock fragment content—0 to 35 percent gravel

Bg1 horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 to 4 moist or dry
Texture—sandy loam, fine sandy loam, or loam
Clay content—3 to 18 percent
Rock fragment content—5 to 35 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Bg2 horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 to 4 moist or dry
Texture—sandy loam, fine sandy loam, or loam
Clay content—6 to 18 percent
Rock fragment content—5 to 40 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Cd horizon:
Hue—2.5Y or 5Y
Value—4 to 5 moist, 5 to 7 dry
Chroma—1 to 3 moist or dry
Texture—sandy loam or loam
Clay content—4 to 18 percent
Rock fragment content—5 to 30 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones

Formation of the Soils

Thirty-nine soil types are described and delineated within the county. The appearance and properties of these soils are a result of the interaction of five soil-forming factors—climate, biological factors, topography, parent material, and time. Although each of the factors is discussed separately, they are inseparable with respect to soil formation. For example, a change in the climate influences the ecology that is adapted to a soil type.

Climate

The climate of the county is characterized by warm, dry summers and cool, moist winters. It is on the leeward side of the Olympic Mountains in Washington and the mountains of Vancouver Island in British Columbia. Thus, the central part of the county is in a topographic rainshadow that is unique to western Washington. Annual precipitation in this part of the county, near Coupeville, is as little as 20 inches, making it one of the driest areas in western Washington. In contrast, annual precipitation in the southern and northern parts of the county is as much as 40 inches. The proximity of the county on all sides to temperature-moderating coastal water, however, results in a mosaic of vegetation patterns that includes characteristics of both the lower and higher precipitation zones. This effect can be described as microclimates. In addition, differences in exposure to sunlight and wind throughout the county add to the effect of the microclimates. On sloping southerly aspects, such as those in the central part of the area, most notably the Kettleholes area, near Coupeville, the Hoypus, Whidbey, and Keystone series support a drier and more open vegetative community as a result of the greater solar radiation and subsequent higher rate of evapotranspiration. On sloping northerly aspects, the Everett and Alderwood series support a more moist vegetative community. Wind exposure can also play a role in the plant communities that become established and the soil types that form in a given area. In areas near Coupeville, prevailing winds blow across the open waters of the Strait of Juan de Fuca and Admiralty Inlet moderating air and soil temperatures in exposed areas.

Biological Factors

Organisms affect soil formation in many ways. Pioneering organisms, such as lichens, facilitate the weathering of rock into soil. Mixing of soil horizons can occur when trees are toppled by wind or burrowing animals excavate soil material. Other soil fauna, such as insects and worms, increase the porosity of soils. Increased porosity increases the ability of a soil to perform functions such as storing water, cycling nutrients, and providing a medium for plant roots. The color and thickness of a surface layer is significantly influenced by the plant community. Soils that have formed under a grassland vegetation community, such as the Snakelum and San Juan series, have a thick, dark-colored surface layer as a result of biomass being concentrated in the root zone. In contrast, forested soils, such as the Everett and Whidbey series, have a lighter colored surface layer and a layer of duff on top of the mineral soil. In some instances, the organisms that have acted on or within a soil have changed since the soil material was first deposited. For example, the upper part of the

profile of the Ebeys, Coveland (prairie phase), and Coupeville (prairie phase) series is enriched with decomposing organic matter. This could be the result of several factors, including the plant community that existed immediately following deglaciation and the subsequent changes in sea level. Fluctuations in sea level likely inundated these areas with shallow marine bays or estuaries rich in organic matter. Once these areas rebounded above sea level, they were still affected by a pronounced seasonal high water table, which would have preserved much of the organic matter produced under the new plant community as well as that from the marine setting. It also appears that Native Americans preserved a nonforested vegetative community through burning. Maintenance of grassland types of vegetation results in a thick, dark-colored surface layer, such as in the Snakelum and San Juan series.

Topography

Landscapes in the county are the result of a complex geologic history. The last glacial episode, the Vashon Stade, imprinted much of the modern surface topography (Booth, 1994). A variety of glacial depositional and erosional settings gave the landscape its present appearance. For example, the low relief of the area northwest of Ebey's Prairie is due to the nature of a deltaic glacial outwash setting, with sediment being laid down in flat beds. By contrast, the pitted and sloping terrain of the Kettleholes area is the result of ice margin deposition, with sediment randomly deposited and moved around by blocks of melting ice. In the lowest lying areas of the county, the effect of submarine glacial meltwater and erosional forces that sculpted previously deposited dense glaciomarine sediment can be seen (Polenz and others, 2005). Following glaciation, the land surface rebounded as the weight of the glacial ice lessened. As a result of the rebounding surface and subsequent changes in sea level, sediment that was deposited in a marine environment can now be found at elevations of as much as 300 feet. Areas above 300 feet were not inundated by marine waters; thus, they exhibit erosional and depositional characteristics more common to terrestrial glacial deposition.

Soils in the county are the result of the various forces that shaped the landscape. Topographic effects such as slope steepness, shape, and aspect significantly affect the distribution of soil moisture and the plant communities in an area. Slope shape affects erosion and deposition as exhibited by areas of the Coupeville-Mitchellbay complex, 0 to 5 percent slopes. The deep Coupeville soils are in concave positions where soil material tends to accumulate whereas the moderately deep Mitchellbay soils are in slightly convex positions that are subject to erosion. In nearly level areas underlain by dense sediment, the soils have characteristics attributed to a seasonal high water table, such as redoximorphic concentrations and depletions that are the result of brief anaerobic conditions. These features are exhibited by dark red and black streaks and spots surrounded by light gray material. The Zylstra, Mitchellbay, Coveland, and Sholander series are examples of soils that have been affected by redoximorphic processes. The Semiahmoo and Shalcar series, which are in drainageways and depressions, exist under a more persistent seasonal high water table and as a result are richer in organic matter. This is due in part to the increased production of biomass under these settings, but it is also due to the prolonged anaerobic condition of the soils, which slows decomposition and preserves organic matter.

Parent Material

Parent material refers to the kind of material in which a soil has formed. The soils in the county have formed in a variety of types of glacial parent material. For example, the San Juan, Keystone, Hoypus, and Everett series formed in glacial outwash, which is characterized as unconsolidated sandy and gravelly material. This coarse material

extends through the entire depth of the soil profile and is responsible for the overall droughty nature of the soils.

Some soils formed in glaciomarine drift. This material can be coarse textured to fine textured, and it is the result of deposition in an aqueous environment, where particles settled out of the water column. The amount of clay, silt, or sand that is deposited depends on how fast or slow the water flows. In slow-moving, deep water environments, silt and clay are the primary particles deposited. Soils in areas below an elevation of 300 feet, such as the Mitchellbay, Coveland, and Coupeville series, formed in this environment. These soils have a high content of clay in the subsoil, which is the result of the original depositional sequence of the higher clay-bearing parent material. Other soils formed in glacial drift that was deposited outside of the deepwater environment. These soils include the Elwha, Zylstra, and Morancreek series. They have less clay and are coarser textured because of the higher velocity of the water or the terrestrial deposition from the overlying glaciers. These soils typically are at elevations of more than 300 feet or are in areas that were not subject to deep glacial meltwater. In some areas the soils have been reworked by meltwater streams, which stripped away the finer textured material.

Soils derived from glacial drift can have a densic horizon, which is restrictive to roots and water and is a result of the sediment consolidating over time. Finer textured densic horizons, such as those in the Mitchellbay series, formed in glaciomarine drift. Occasionally, isolated rock fragments (gravel and cobbles) are in the dense material. These fragments are called dropstones and are further evidence that the material was deposited in an aqueous environment. The dropstones consist of rock fragments that were on or in floating ice. When the ice melted, these fragments were dropped into the underlying finer textured sediment. Coarser textured densic horizons, such as those in the Elwha and Zylstra series, tend to have a higher content of gravel. The lack of finer textured material and the higher content of coarse fragments are probably due to the higher energy environment in which the material was deposited.

During the wetter months of the year (October through May), a perched water table develops above the dense glacial sediment. In nearly level to gently sloping areas, the perched water table will reach the surface and may pond water at the soil surface for brief periods. These sites typically support plant communities that reflect the higher amount of moisture in the profile during the growing season. A fluctuating water table also contributes to the morphological appearance of these soils as exhibited by redoximorphic concentrations and depletions.

In some areas, the water table can persist for much of the year, which is conducive to the accumulation of organic matter under anaerobic conditions. The Shalcar and Semiahmoo series formed in dominantly organic parent material in these areas. In drier areas, soils such as the Snakelum and San Juan series also have a high amount of organic matter in the upper part because of the existing plant community, which is mainly grasses. This accumulation of organic material has a positive influence on the available water capacity of the soils.

In other post-glacial settings, windblown soil particles have accumulated on top of glacial sediment. This is known as eolian material. Soils that formed in eolian material, such as those along the western bluffs in the Ebey's Landing National Historical Reserve (San Juan series) and those of Ebey's Prairie (Ebeys series), are typified by well-sorted sand particles that can extend deep into the soil profile. Sandy beach sediment was deposited (Indianola series) in other areas. As a result of glacial rebound, many beach deposits are as much as 300 feet above sea level.

Time

Formation of a soil is ultimately the result of the interaction of the previously discussed soil-forming factors in relation to time. The end of the last glaciation of the Puget Lowlands, including the county, effectively set the time for soil formation to begin

about 16,000 years ago (Porter and Swanson, 1998). Soil formation has progressed since that time as a result of four general soil-forming processes—additions, losses, transformations, and translocations. Soil horizons, or layers, are a result of these processes acting over time.

The dark-colored surface layer of soils such as the Coupeville, Ebeys, and Limepoint series is the result of additions of organic matter that can occur over a relatively short amount of time. Redoximorphic concentrations and depletions in the subsoil of the Spieden, Mitchellbay, and Sholander series are evidence of transformation and translocation of iron due to periodic saturation. These concentrations and depletions can form in a short amount of time, but they can persist for long periods of time because of the slow nature of losses within the soil environment. Many of these same soils exhibit an albic horizon, which forms with the loss of iron and clay particles as a result of the movement of water through the soil profile.

An argillic horizon forms in some soils as a result of the translocation of clay from the surface horizon to subsurface horizons. The process can take place over thousands of years. The soils in this county are too young to have developed a well-formed argillic horizon. Some of the clay that is in the subsoil of soils such as those of the Mitchellbay, Coveland, Bazal, and Pilepoint series is not a result of translocation but of the texture of the original sediment. In some of the wetter soils, such as the Coveland series, the dense, impermeable layer is slowly being weathered and can be penetrated by roots. These soils are on stable surfaces and have been forming since the ice retreated and the land rebounded to above sea level.

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Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the “National Soil Survey Handbook” (available in local offices of the Natural Resources Conservation Service or on the Internet).

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

Abrupt textural change. A soil horizon boundary or thin transitional zone characterized by a considerable increase in clay that occurs at the contact between a surface layer, subsurface layer, subsoil, or substratum.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Albic horizon. An eluvial horizon that is at least 1 centimeter thick or more. The color of the soil material is largely determined by the color of primary sand and silt particles rather than by the color of their coatings (Soil Survey Staff, 1999).

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone. A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan. A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha, alpha-dipyridyl. A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Alpine. Characteristic of or resembling the European Alps, or any lofty mountain or mountain system, especially one so modified by intense glacial erosion as to

contain cirques, horns, etc. Sometimes used to designate areas above or near timberline.

Amophibolite. A rock consisting largely of hornblende.

Andesite. A fine-grained volcanic rock consisting mainly of plagioclase feldspar with small amounts of pyroxene, hornblende, or biotite. It is dark colored, mainly shades of gray or green.

Andic soil properties. A collection of physical and chemical properties that define the criteria for the Andisol order (Soil Survey Staff, 1999).

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Anticline. A unit of folded strata that is a convex upland. In a single anticline, beds forming the opposite limbs of the fold dip away from its axial plane.

Apite. Light-colored, finely grained granite made up of quartz and feldspar.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay (Soil Survey Staff, 1999).

Aridic. A soil moisture regime common to a climate that lacks soil moisture available for plant growth during the growing season. The soils are dry for more than 50 percent of the growing season (Soil Survey Staff, 1999).

Arkose. Sandstone containing unaltered feldspar; usually formed in mountainous regions from weathered granite.

Ash (volcanic). Unconsolidated, pyroclastic material less than 2 millimeters in all dimensions; commonly called volcanic ash.

Ashy (family particle-size class). A substitute class term used for the family particle-size in mineral soils (Soil Survey Staff, 1999).

Ashy (textural modifier; for example, ashy sandy loam). A term used to describe material in which the fine-earth fraction has 30 percent or more particles that are 0.02 to 2.0 millimeters in diameter. Of this, 5 percent or more is volcanic glass and the ammonium oxalate extractable aluminum plus ½ the ammonium oxalate extractable iron times 60 added to the percentage of volcanic glass are equal to or more than 30.

Aspect. The direction toward which a slope faces. Also called slope aspect.

Aspect, north. All compass directions with a northerly aspect, including west-northwest, northwest, north-northwest, north, north-northeast, northeast, and east-northeast. North aspects have less solar radiation than south aspects and consequently are cooler and more moist.

Aspect, south. All compass directions with a southerly aspect, including east-southeast, southeast, south-southeast, south, south-southwest, southwest, and west-southwest. South aspects have more solar radiation than north aspects and consequently are warmer and more droughty.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Avalanche chute. The central channel-like corridor, scar, or depression along which an avalanche has moved. It may take the form of an open path in a forest, with bent and broken trees, or an eroded surface marked by pits, scratches, and grooves.

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp. A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland. A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basalt. A fine-grained, dark-colored extrusive igneous rock composed primarily of calcic plagioclase and pyroxene, with or without olivine.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology). A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Basin. A low area in the earth's crust, of tectonic origin, in which sediment has accumulated.

Batholith. A large, domed mass of intrusive igneous rock such as granite.

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Bottom land. An informal term loosely applied to various portions of a flood plain.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Breccia. Coarse grained, clastic rock made up of angular broken rock fragments that are held together by mineral cement or are in a fine-grained matrix.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Bulk density. The mass of soil per unit bulk volume. Moist bulk density refers to the oven-dry weight of a given volume of soil with moisture content at or near field moisture capacity.

Butte. An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Calcic horizon. A subsurface horizon that has an accumulation of calcium carbonate or of calcium and magnesium carbonate (Soil Survey Staff, 1999).

Calcium carbonate equivalent. The quantity of carbonates (CO3) in the soil, expressed as CaCO3 and as a percentage by weight of the fraction less than 2 millimeters in size.

Caliche. A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

Cambic horizon. A mineral soil horizon that is loamy very fine sand or finer textured and has soil structure rather than rock structure. The cambic horizon contains some weatherable minerals, and it is characterized by alterations or removals as indicated by redoximorphic features or by stronger chroma or redder hue than that of the underlying horizons (Soil Survey Staff, 1999).

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Canyonland (general landscape). A deeply dissected landscape composed dominantly of relatively narrow flood plains or valley floors, commonly with considerable outcroppings of bedrock on steep slopes, ledges, or cliffs and with broad summits or interfluves.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Carbonates. Chemical compounds containing the carbonate ion C03 in combination with bases such as calcium, magnesium, potassium, and sodium.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. See Terracettes.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cinder. A glassy vesicular pyroclastic volcanic fragment that is 2 millimeters or more in all dimensions and is strongly cemented or has a stronger degree of cementation.

Cirque. A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clastic. Pertaining to rock or sediment composed mainly of fragments derived from pre-existing rock or minerals and moved from their place of origin.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax forest stage. The culminating forest succession stage. Overstory vegetation is dominated by trees that are climax for the site. Vertical depth of the understory and overstory canopies is at a maximum. Seedlings to maximum-size, mature trees are present in varying amounts, resulting in an uneven-aged stand.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Climax tree. The most competitive tree capable of growing on a particular site.

Coarse textured soil. Sand or loamy sand.

Coarse-loamy. A loamy particle-size class that is 15 percent or more fine sand or coarser, including fragments as much as 3 inches in diameter, and is less than 18 percent clay in the fine-earth fraction.

Coarse-silty. A loamy particle-size class that is less than 15 percent fine sand or coarser, including fragments as much as 3 inches in diameter, and is less than 18 percent clay in the fine-earth fraction.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (for example, direct gravitational action) and by local, unconcentrated runoff.

Compaction. The increase in soil bulk density as a result of applied loads or pressure. Compaction reduces porosity, water infiltration, and root penetration.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. See Redoximorphic features.

Conglomerate. A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Coniferous. Pertaining to plants of the *Coniferales* order of the *Gymnospermae* subdivision. Coniferous plants have cone fruit and are commonly, but not always, evergreen. Examples include ponderosa pine, Douglas-fir, and western larch.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Continental glaciation. Refers to the glaciers that covered much of North America during the Ice Age, as opposed to contemporary glaciers associated with mountains.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). A type of limnic layer composed predominantly of fecal material derived from aquatic animals.
Cordilleran ice sheet. The glacial ice sheet that covered much of the northern half of North America, from the eastern face of the Rocky Mountains to the Pacific Ocean, during the Pleistocene.
Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.
Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.
Coulee. A dry or intermittent stream valley, especially a long, steep-walled gorge representing a channeled scabland overflow channel that carried meltwater from the glacial Lake Missoula floods.
Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.
Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.
Cropping system. Growing crops according to a planned system of rotation and management practices.
Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.
Crown. The upper part of a tree or shrub, including the living branches and their foliage.
Cryic. A soil temperature regime in which the mean annual soil temperature at a depth of 20 inches ranges from 33 to 46 degrees F. The mean summer soil temperature is less than 47 degrees for soils that have an O horizon, and it is less than 59 degrees for soils that do not have an O horizon.
Cryoturbate. A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.
Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.
Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.
Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.
Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.
Delta. A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.
Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.
Densic contact. A boundary between soil and coherent underlying material that restricts the penetration of roots, is not cemented, and is typically referred to as dense glacial till and as a Cd horizon.
Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately

deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement. A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diagnostic horizons. Combinations of specific soil characteristics that are indicative of certain classes of soils. Those that occur at the soil surface are called epipedons, and those that occur below the soil surface are called diagnostic subsurface horizons.

Diamict. A nonsorted or poorly sorted, unconsolidated deposit that contains a wide range of particle sizes, commonly from clay to cobble- or boulder-sized, rounded and/or angular fragments with a clayey, silty, or sandy matrix, depending on the local source bedrock.

Diatomaceous earth. A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dike. An intrusion of rock that cuts across the bedding or foliation of the pre-existing rock.

Diorite. A coarse-grained igneous rock consisting mainly of plagioclase but with smaller amounts of hornblende, biotite, and pyroxene. Quartz is absent or sparse. See Quartz diorite.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Dolomite. A sedimentary rock consisting mainly of the mineral dolomite, which is a carbonate of magnesium.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw. A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift. A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains,

eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune. A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Durinodes. Nodules that are weakly cemented to indurated with silica oxide (SiO_2).

Duripan. A subsurface soil horizon that is cemented by illuvial silica, commonly opal or microcrystalline forms of silica, to the degree that less than 50 percent of the volume of air-dry fragments will slake in water or hydrochloric acid.

Earthy fill. See Mine spoil.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Effervescence. The gaseous response exhibited as bubbles on the soil ped when drops of dilute (1:10) hydrochloric acid (HCl) are applied. This response typically indicates the presence of calcium carbonates ($CaCO_3$).

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erratic. Refers to a rock fragment transported by glacial ice or floating ice that is different from the bedrock in the area in which it is deposited.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface. A land surface shaped by the action of erosion, especially by running water.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion

or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Esker. A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant. A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fault. A fracture or fracture zone of the earth with displacement along one side in respect to the other.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Fine-loamy. A loamy particle-size class that is 15 percent or more fine sand or coarser, including fragments as much as 3 inches in diameter, and is 18 to 34 percent clay in the fine-earth fraction.

Fine-silty. A loamy particle-size class that is less than 15 percent fine sand or coarser, including fragments as much as 3 inches in diameter, and is 18 to 34 percent clay in the fine-earth fraction.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay. A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.

Foliated. Refers to metamorphic rock that exhibits parallel structure or layering.

Foothills. A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope. The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Forestland. Land on which the historic vegetation was dominated by a 25 percent overstory canopy cover of trees, as determined by crown perimeter-vertical projection. A tree is defined as a woody-stemmed plant that can grow to 4 meters (about 13 feet) in height at maturity.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Fragmental. A particle-size class used to classify mineral soils that have less than 10 percent by volume fine-earth soil material.

Frigid. A soil temperature regime in which the mean annual soil temperature at a depth of 20 inches ranges from 33 to 46 degrees F. The mean summer soil temperature is more than 47 degrees for soils that have an O horizon. The difference between the mean winter soil temperature and the mean summer soil temperature is more than 9 degrees F.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphic surface. A mappable area of the earth’s surface that has a common history; the area is of similar age and is formed by a set of processes during an episode of landscape evolution.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graben. An elongated, relatively depressed unit or block of the earth’s crust that is bounded by faults on its long sides.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.
Granite. A coarse-grained igneous rock consisting mainly of quartz and feldspar, with more orthoclase than plagioclase. See Granodiorite.
Granitic. Term generally applied to granite or granitelike rock. It is used when referring to granite, granodiorite, quartz monzonite, quartz diorite, diorite, and granitic gneiss.
Granitic gneiss. A crystalline, banded metamorphic rock of granitic composition.
Granodiorite. A coarse-grained igneous rock consisting mainly of quartz and feldspar, with more plagioclase than orthoclase. See Granite.
Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
Graywacke. An indurated sedimentary rock that consists mainly of sand-sized grains but contains fragments of feldspar, quartz, and ferromagnesian minerals.
Grazing system, planned. A system for managing rangeland in which three or more fields are alternately grazed and then rested in a planned sequence for a period of years.
Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
Ground water. Water filling all the unblocked pores of the material below the water table.
Grus. The fundamental products of *in situ* granular disintegration of granite and granitic rock, dominated by intercrystal disintegration.
Gully. A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.
Gypsum. A mineral consisting of hydrous calcium sulfate.
Habitat type. The collective area occupied by a single plant association. It is defined and described on the basis of the vegetation and its associated environment.
Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.
Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.
Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.
Head slope (geomorphology). A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.
Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.
High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next

crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope. A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Histic epipedon. A thin, organic soil horizon that is saturated with water at some time during the year unless it is artificially drained. This horizon is at or near the surface of a mineral soil. It contains more than 12 percent organic carbon (Soil Survey Staff, 1999).

Historic climax plant community. The plant community that was best adapted to the unique combination of factors associated with the ecological site. It was in a natural dynamic equilibrium with the historic biotic, abiotic, and climatic factors on its ecological site in North America at the time of European immigration and settlement.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

L horizon.—A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Consolidated bedrock beneath the soil that has an extremely weakly cemented to moderately cemented rupture-resistance class.

R horizon.—Consolidated bedrock beneath the soil that has a strongly cemented or stronger rupture-resistance class.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Indurated. Refers to having a hard, brittle consistency as a result of particles being held together by cementing substances such as silica, calcium carbonate, and iron. An indurated layer can be broken by a sharp blow of a hammer.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Intermontane basin. A generic term for a wide structural depression between mountain ranges that is partly filled with alluvium.

Intrusive rock. Igneous rock derived from molten matter (magmas) that invaded pre-existing rock and cooled below the surface of the earth.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. See Redoximorphic features.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Kettle. A steep-sided, usually basin- or bowl-shaped hole or depression, commonly without surface drainage in glacial-drift deposits, often containing water.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. See Saturated hydraulic conductivity.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace. A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Lamella. A thin, discontinuous or continuous, generally horizontal layer of fine material (especially clay and iron oxides) that has been pedogenically concentrated (illuviated) within a coarser (e.g., sandy), eluviated layer.

Landform. Any physical, recognizable form or feature on the earth's surface that has a characteristic shape and range in composition and is produced by natural causes; it can span a wide range in size. Landforms provide an empirical description of similar portions of the earth's surface.

Landscape (soils). An assemblage, group, or family of spatially related, natural landforms over a relatively large area; the land surface which the eye can comprehend in a single view.

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.
Leeward. Being in or facing the direction toward which the wind is blowing.
Limestone. Sedimentary rock consisting mainly of calcium carbonate ($CaCO3$).
Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.
Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.
Lithic contact. A boundary between soil and coherent underlying material, typically bedrock. The bedrock has a cementation class of strongly cemented or stronger and is typically referred to as an R horizon.
Lithologic discontinuity. A significant change in particle-size distribution or mineralogy that indicates a difference in the material from which the soil horizons have formed.
Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.
Loamy-skeletal. A particle-size class in which rock fragments 2 millimeters in diameter or larger make up 35 percent or more by volume. The fine-earth fraction is loamy.
Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.
Longshore drift. Material (such as sand or gravel) that is moved parallel to and near a shore.
Low strength. The soil is not strong enough to support loads.
Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.
Major Land Resource Area (MLRA). A broad geographic land area characterized by a particular pattern of soils, geology, climate, water resources, and land use. An area is typically continuous, but small separate areas can occur.
Mass movement. A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.
Masses. See Redoximorphic features.
Mature forest stage. A forest successional stage in which the most shade-tolerant adapted tree species are well represented (more than 50 percent composition) and are dominant in the middle to upper canopy layers. Trees generally are more than 9 inches in diameter at breast height, and the canopy cover is more than 25 percent.
Meander belt. The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.
Meander scar. A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.
Meander scroll. One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medial (family particle-size class). A substitute class term used for the family particle-size class in mineral soils (Soil Survey Staff, 1999).

Medial (textural modifier, such as medial loam). A USDA textural modifier used in conjunction with a USDA mineral soil texture to indicate unique physical and chemical properties. The properties are defined in Soil Taxonomy and are typically low bulk density, high content of iron and aluminum, and high retention of phosphate (Soil Survey Staff, 1999).

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Mesic. A soil temperature regime in which the mean annual temperature at a depth of 20 inches ranges from 47 to 58 degrees F. The difference between the mean winter soil temperature and the mean summer soil temperature is more than 9 degrees F.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

Microclimate. The climate of a small distinct area, as of a forest or city, or a confined space, as of a building or greenhouse.

Mine spoil. An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. A kind of map unit component that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Moisture control section. The layer within a soil profile used to determine the soil moisture regime. The upper boundary is the depth to which a dry soil is moistened by 1 inch of water in 24 hours. The lower boundary is the depth to which a dry soil is moistened by 3 inches of water in 48 hours.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil (Soil Survey Staff, 1999).

Moraine. In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—

fine, medium, and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Mountain valleys. Any small, externally drained depression floored with either till or alluvium, that occurs on a mountain or within mountains. See intermontane basins.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat. A USDA texture associated with organic soils that meet the degree of organic matter decomposition associated with hemic soil material.

Mudstone. A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil (Soil Survey Staff, 1999).

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. See Redoximorphic features.

Nose slope (geomorphology). A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Ochric epipedon. A surface horizon of mineral soil that is too light in color, too high in chroma, too low in organic carbon, or too thin to be a mollic, umbric, or histic epipedon (Soil Survey Staff, 1999).

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Orogenic. Of or pertaining to the process of mountain formation.

Outwash. Stratified and sorted sediment (mainly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain. An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Outwash terrace. A valley train deposit extending along a valley downstream from an outwash plain or terminal moraine; a flat-topped bank of outwash with an abrupt outer face.

Overstory. The trees in a forest stand that form the upper crown cover. See Understory.

Paleoterrace. An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Paralithic contact. A boundary between soil and coherent underlying material that can be dug with difficulty with a spade. It is referred to as weathered bedrock, has a cementation class of moderately cemented or weaker, and is typically referred to as a Cr horizon.

Pararock fragments. Fragments of rock that are 2 millimeters in diameter or more (e.g., paragravel, paracobble, or parastone). Pararock fragments have a moderately cemented to extremely weakly cemented rupture-resistance class.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedologic. Of or pertaining to the processes of soil formation.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual” and in this glossary. Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

See “Saturated hydraulic conductivity” for conversions of inches per hour to micrometers per second.

Perudic. A soil moisture regime common to a climate having moisture throughout the year. The soil moisture control section never becomes dry throughout its thickness during any time of the year (Soil Survey Staff, 1999).

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Phyllite. A fine-textured, foliated metamorphic rock that is intermediate in metamorphic grade between slate and schist. Mica crystals impart a silky sheen to the cleavage surfaces.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Placic horizon. A thin (less than 1 inch thick), black to dark reddish colored horizon that is cemented by iron (or iron and manganese) and organic matter (Soil Survey Staff, 1999).

Plant association. A kind of climax plant community consisting of stands with essentially the same dominant species in corresponding layers.

Plant community. An assemblage of plants living together, reflecting no particular ecological status; a vegetative complex unique in its combination of plants.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology). A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Pleistocene. The epoch of geologic time from approximately 10,000 to 2 million years ago. The earlier of the two epochs comprising the Quaternary period. Also called the Glacial epoch.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Pole stage. A forest successional stage in which the vegetation of a stand is dominantly a moderately dense to very dense overstory of trees that have minimal vertical crown depth. The trees generally range from about 5 to 9 inches in diameter at breast height, and the canopy cover normally exceeds 35 percent.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Pumice. A light-colored, vesicular, glassy pararock fragment. The fragments are more than 2 millimeters in diameter and commonly have the composition of rhyolite. Pumice commonly has a specific gravity of less than 1.0 and is thereby sufficiently buoyant to float on water.

Pyroclastic. Pertaining to fragmental material produced by commonly explosive, aerial ejection of clastic particles from a volcanic vent.

Quartz diorite. A coarse-grained igneous rock consisting mainly of plagioclase with smaller amounts of quartz, hornblende, and biotite. (See Granodiorite.)

Quartz latite. A fine-grained volcanic rock consisting mainly of quartz, plagioclase, and orthoclase with minor amounts of biotite and hornblende. Phenocrysts are common. This rock is the extrusive equivalent of quartz monzonite.

Quartz monzonite. A coarse-grained igneous rock consisting mainly of plagioclase, orthoclase, and quartz with minor amounts of biotite and hornblende. (See Granite and Granodiorite.)

Quartzite. A nonfoliated metamorphic rock consisting mainly of quartz sand cemented with quartz.

Quaternary. The period of the Cenozoic era of geologic time, extending from the end of the Tertiary (about 2 million years ago) to the present and comprising two epochs, the Pleistocene (Ice Age) and the Holocene (Recent).

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which

case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:

   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*

   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*

   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.

2. Redoximorphic depletions.—These are zones of low chroma (chroma less than that of the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:

   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*

   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).

3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Restrictive feature. A nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly reduce the movement of water and/or air through the soil or that otherwise provide an unfavorable root environment.

Rhyodacite. A fine-grained volcanic rock consisting mainly of quartz and feldspar, with more plagioclase than orthoclase. Phenocrysts are common. Ryodacite is the extrusive equivalent of granodiorite.

Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riparian. Refers to areas adjacent to water or wetlands; vegetation is dependent on water or use and management directly impacts the water or wetlands.

Riser. The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Riverwash. Unstable areas of sandy, silty, clayey, gravelly and cobbly sediments. These areas are flooded, washed and reworked by rivers so frequently that they support little or no vegetation; see National Soil Survey Handbook.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments that are 2 millimeters in diameter or more (i.e., gravel, cobbles, stones, and boulders). Rock fragments have a strongly cemented or stronger rupture-resistance class.

Rock outcrop. Exposures of bare bedrock.

Rubble land. Areas that consist of cobbles, stones, and boulders, commonly at the base of mountains.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sandy. A particle-size class in which the texture of the fine-earth fraction is sand or loamy sand but not loamy very fine sand or very fine sand; it is less than 35 percent rock fragments by volume.

Sandy-skeletal. A particle-size class that is 35 percent or more by volume rock fragments 2 millimeters in diameter or larger. The fine-earth fraction is sandy.

Sapling/pole stage. A forest successional stage in which the vegetation of a stand is dominantly saplings and pole-sized trees (generally 2 to 9 inches in diameter at breast height). The canopy cover and understory production are intermediate between the herbaceous or shrub stage and the pole stage.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (K_{sat}). The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "K_{sat}." Terms describing saturated hydraulic conductivity are *very high*, 100 or more micrometers per second (14.17 or more inches per hour); *high*, 10 to 100 micrometers per second (1.417 to 14.17 inches per hour); *moderately high*, 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour); *moderately low*, 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour); *low*, 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour); and *very low*, less than 0.01 micrometer per second (less than 0.001417 inch per hour). To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Schist. A medium- to coarse-grained foliated metamorphic rock in which the platy minerals are clearly visible. Micaceous minerals commonly are present.

Secondary carbonates and silica. Calcium carbonate and silica weathered from the soil matrix in upper soil horizons and then transported and deposited in the lower horizons by water moving through the soil profile.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune. A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slate. A fine-grained metamorphic rock that exhibits strong cleavage or layering.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium. Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill (in tables). The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement (in tables). Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Slump. A mass movement process characterized by a landslide involving shearing and rotary movement of a generally independent mass of rock or earth along a curved slip surface. The mass (slump) has its axis parallel to the slope from which it descends. A slump surface commonly exhibits a reversed slope facing uphill.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spodic horizon. An illuvial horizon that is 85 percent or more spodic material. This layer is dominated by active amorphous material that is illuvial and is composed of organic matter and aluminum, with or without iron (Soil Survey Staff, 1999).

Stone line. In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or

cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stoniness (or boulderiness). The relative proportion of larger rock fragments on the surface layer. Used as map unit phase designation for soils containing sufficient amounts of stones and boulders to impose important restrictions on use and management. These phases should not be confused with the use of fragments as textural modifiers. The four phases recognized in this survey are:

Stony (or bouldery).—The areas have enough stones and boulders at or near the surface to be a continuing nuisance during operations that mix the surface layer, but they do not make most such operations impractical. Conventional, wheeled vehicles can move with reasonable freedom over the area. Rocks may damage both the equipment that mixes the soil and the vehicles that move on the surface. Large rock fragments cover about 0.01 to 0.1 percent of the surface.

Very stony (or very bouldery).—The areas have so many stones and boulders at or near the surface that operations that mix the surface layer either require heavy equipment or use of implements that can operate between the larger ones. Tillage with conventionally powered farm equipment is impractical. Wheeled tractors and vehicles with high clearance can operate on carefully chosen routes over and around stones and boulders. Large rock fragments cover about 0.1 to 3 percent of the surface.

Extremely stony (or extremely bouldery).—The areas have so many stones and boulders at or near the surface that wheeled powered equipment, other than some special types, can operate only along selected routes. Tracked vehicles can be used in most places, although some routes have to be cleared. Large rock fragments cover about 3 to 15 percent of the surface.

Rubbly and very rubbly.—The areas have so many stones and boulders at or near the surface that tracked vehicles cannot be used in most places. Large rock fragments cover about 15 to 90 percent of the surface.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Strath terrace. A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subaqueous. Refers to conditions and processes, features, or deposits that exist in or under water, especially fresh water, as in a lake or stream.
Subduction. The process of one lithospheric plate descending beneath another.
Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.
Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.
Substratum. The part of the soil below the solum.
Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.
Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.
Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.
Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."
Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.
Tailings. Areas of washed ore left in uneven piles after placer mining activities such as sluicing, hydraulicing, or dredging.
Talus. Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.
Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.
Tectonic. Pertaining to the forces involved in, or the resulting structures of, deformation of the earth's crust.
Terminal moraine. An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.
Terrace (conservation). An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.
Terrace. (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.
Terracettes. Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.
Terrane. A group of related rocks and the area in which they are exposed at the earth's surface.
Tertiary. The period of geologic time from approximately 2 to 63 million years ago (radiometric dates). The earlier of the two geologic periods comprising the Cenozoic era.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”
Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.
Thrust fault. A fault with a dip of 45 degrees or less on which the hanging wall appears to have moved upward relative to the footwall.
Till. Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.
Till plain. An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.
Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.
Toeslope. The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.
Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.
Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
Tread. The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.
Tuff. A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.
Udic. A soil moisture regime common to a climate that has moisture throughout the year. The soil moisture control section is dry for less than 45 consecutive days during the 4 months following the summer solstice (Soil Survey Staff, 1999).
Umbric epipedon. A thick, dark-colored, humus-rich surface horizon that has low base saturation and pedogenic soil structure. It may include the upper part of the subsoil (Soil Survey Staff, 1999).
Understory. Plants in a forest community that grow to a height of 4.5 feet or less.
Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.
Valley fill. The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.
Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.
Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.
Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of

water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Welded tuff. A glass-rich rock that has been indurated by the welding together of its glass shards under the combined action of the heat retained by particles, the weight of overlying material, and hot gasses.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Xeric. A soil moisture regime common to a climate having moist winters and dry summers. The soils are dry in the moisture control section for more than 45 consecutive days during the 4 months following the summer solstice and are moist for more than 45 consecutive days during the 4 months following the winter solstice (Soil Survey Staff, 1999).

Young forest stage. A forest successional stage in which the overstory vegetation of a stand is dominantly shade-intolerant successional trees. Trees generally are more than 9 inches in diameter at breast height, and the canopy cover exceeds 25 percent. Shade-tolerant climax tree species can be absent to nearly well represented (less than 50 percent).

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
OAK HARBOR SE QUADRANGLE
SHEET NUMBER 10 OF 44

Joins sheet 17, Coupeville NE

SCALE 1:12000

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

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OAK HARBOR SE, WASHINGTON
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
CRESCENT HARBOR SW QUADRANGLE
SHEET NUMBER 11 OF 44

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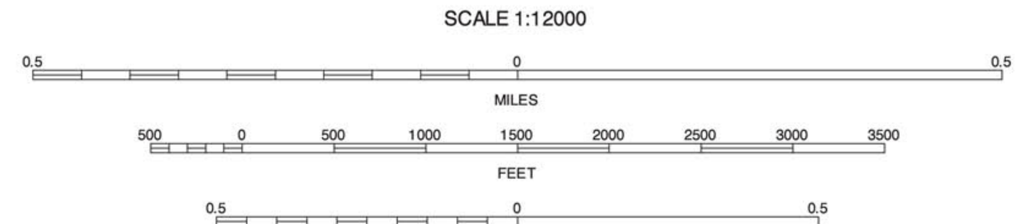

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ISLAND COUNTY, WASHINGTON
CRESCENT HARBOR SE QUADRANGLE
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Joins sheet 19, Camano NE

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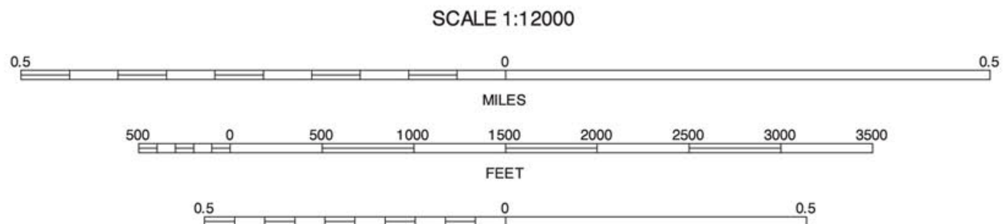

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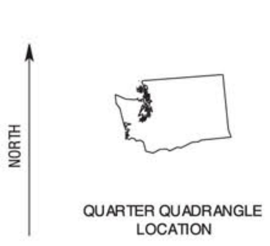

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UNITED STATES
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ISLAND COUNTY, WASHINGTON
PORT TOWNSEND NORTH NE QUADRANGLE
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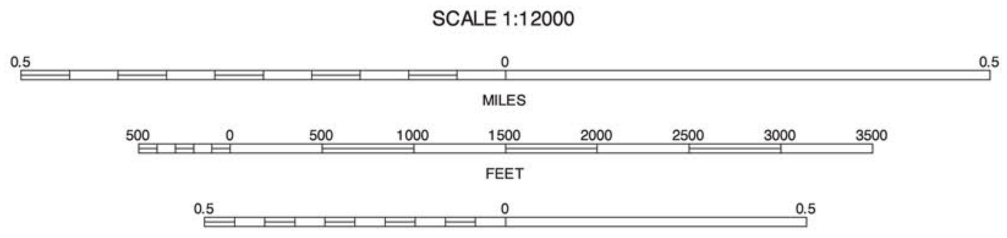
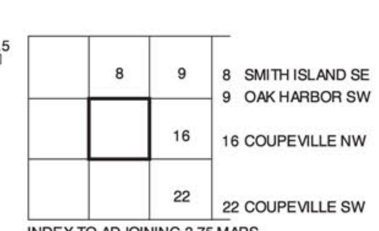
QUARTER QUADRANGLE LOCATION

SCALE 1:12000





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NORTH

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MILES: 0.5 — 0 — 0.5

FEET: 500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500

KILOMETERS: 0.5 — 0 — 0.5

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ISLAND COUNTY, WASHINGTON
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SCALE 1:12000

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NORTH

QUARTER QUADRANGLE LOCATION

MILES 0.5 0 0.5

FEET 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS 0.5 0 0.5

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ISLAND COUNTY, WASHINGTON
DECEPTION PASS SE QUADRANGLE
SHEET NUMBER 1 OF 44

SCALE 1:12000

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ISLAND COUNTY, WASHINGTON
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14 UTSALADY SE
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25 CAMANO SE
26 JUNIPER BEACH SW
27 JUNIPER BEACH SE

INDEX TO ADJOINING 3.75 MAPS

JUNIPER BEACH NW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 20 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 13, Utsalady SW

Joins sheet 14, Utsalady SE

Joins sheet 20, Juniper Beach NW

Joins sheet 26, Juniper Beach SW

Joins sheet 27, Juniper Beach SE

SCALE 1:12000

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

MILES

FEET

KILOMETERS

INDEX TO ADJOINING 3.75 MAPS

13 UTSALADY SW
14 UTSALADY SE
20 JUNIPER BEACH NW
26 JUNIPER BEACH SW
27 JUNIPER BEACH SE

JUNIPER BEACH NE, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 21 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
COUPEVILLE SW QUADRANGLE
SHEET NUMBER 22 OF 44

SCALE 1:12000

MILES

FEET

KILOMETERS

QUARTER QUADRANGLE LOCATION

NORTH

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15	16	17
		23

15 PORT TOWNSEND NORTH NE
16 COUPEVILLE NW
17 COUPEVILLE NE
23 COUPEVILLE SE

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

COUPEVILLE SW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 22 OF 44

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
COUPEVILLE SE QUADRANGLE
SHEET NUMBER 23 OF 44

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service,and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

16	17	18	16 COUPEVILLE NW 17 COUPEVILLE NE 18 CAMANO NW
22		24	22 COUPEVILLE SW 24 CAMANO SW
		28	28 FREELAND NW

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COUPEVILLE SE, WASHINGTON
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
CAMANO SW QUADRANGLE
SHEET NUMBER 24 OF 44

Joins sheet 17, Coupeville NE
Joins sheet 18, Camano NW
Joins sheet 19, Camano NE

Joins sheet 23, Coupeville SE
Joins sheet 25, Camano SE
Joins sheet 28, Freeland NW
Joins sheet 29, Freeland NE

SCALE 1:12000

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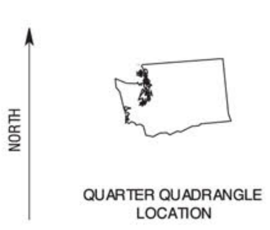
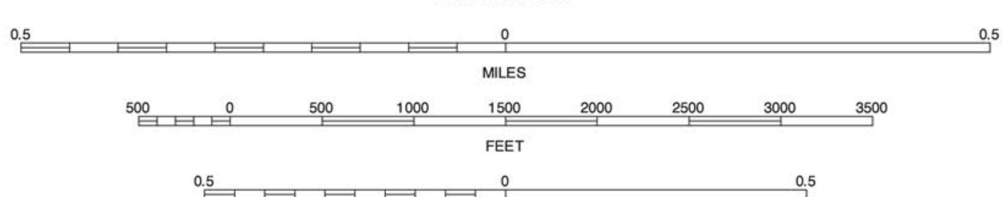
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





17	18	19
23		25
	28	29

17 COUPEVILLE NE
18 CAMANO NW
19 CAMANO NE
23 COUPEVILLE SE
25 CAMANO SE
28 FREELAND NW
29 FREELAND NE

INDEX TO ADJOINING 3.75 MAPS

CAMANO SW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 24 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 18, Camano NW

Joins sheet 19, Camano NE

Joins sheet 20, Juniper Beach NW

122° 33′45″ — 122° 30′00″

48°11′15″

48° 07′30″

Joins sheet 24, Camano SW

Joins sheet 26, Juniper Beach SW

Joins sheet 28, Freeland NW

Joins sheet 29, Freeland NE

Joins sheet 30, Langley NW

SCALE 1:12000

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 10.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

MILES · FEET · KILOMETERS

18	19	20
24		26
28	29	30

18 CAMANO NW
19 CAMANO NE
20 JUNIPER BEACH NW
24 CAMANO SW
26 JUNIPER BEACH SW
28 FREELAND NW
29 FREELAND NE
30 LANGLEY NW

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CAMANO SE, WASHINGTON

3.75 MINUTE SERIES
SHEET NUMBER 25 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
JUNIPER BEACH SW QUADRANGLE
SHEET NUMBER 26 OF 44

Joins sheet 19, Camano NE

Joins sheet 21, Juniper Beach NE

Joins sheet 20, Juniper Beach NW

122° 30'00" | 122° 26'15"

48°11'15" | 48°07'30"

Joins sheet 25, Camano SE

Joins sheet 27, Juniper Beach SE

Joins sheet 29, Freeland NE

Joins sheet 30, Langley NW

Joins sheet 31, Langley NE

SCALE 1:12000

MILES | FEET | KILOMETERS

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

19	20	21
25		27
29	30	31

19 CAMANO NE
20 JUNIPER BEACH NW
21 JUNIPER BEACH NE
25 CAMANO SE
27 JUNIPER BEACH SE
29 FREELAND NE
30 LANGLEY NW
31 LANGLEY NE

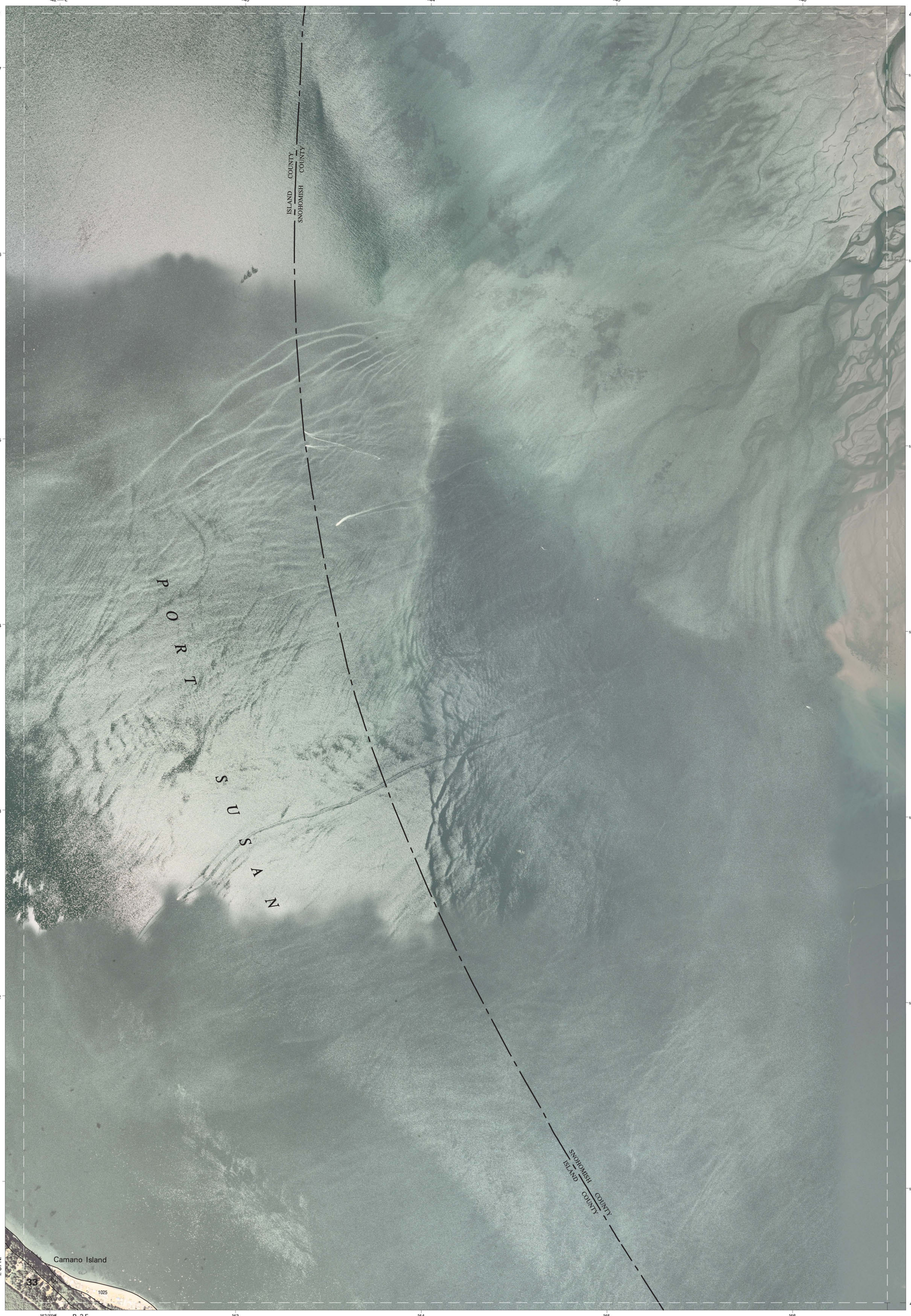
INDEX TO ADJOINING 3.75 MAPS

JUNIPER BEACH SW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 26 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 20, Juniper Beach NW

Joins sheet 21, Juniper Beach NE



Joins sheet 26, Juniper Beach SW

Joins sheet 31, Langley NE

Joins sheet 30, Langley NW

Joins sheet 32, Tulalip NW

SCALE 1:12000

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

20	21	
26		
30	31	32

20 JUNIPER BEACH NW
21 JUNIPER BEACH NE
26 JUNIPER BEACH SW
30 LANGLEY NW
31 LANGLEY NE
32 TULALIP NW

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JUNIPER BEACH SE, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 27 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

SCALE 1:12000

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North American Datum of 1983 (NAD83), GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 10.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

MILES

FEET

KILOMETERS

23	24	25
		29
	33	34

23 COUPEVILLE SE
24 CAMANO SW
25 CAMANO SE
29 FREELAND NE
33 FREELAND SW
34 FREELAND SE

INDEX TO ADJOINING 3.75 MAPS

FREELAND NW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 28 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 24, Camano SW

Joins sheet 26, Juniper Beach SW

Joins sheet 25, Camano SE

Joins sheet 28, Freeland NW

Joins sheet 30, Langley NW

Joins sheet 34, Freeland SE

Joins sheet 33, Freeland SW

Joins sheet 35, Langley SW

SCALE 1:12000

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

MILES

FEET

KILOMETERS

24	25	26
28		30
33	34	35

24 CAMANO SW
25 CAMANO SE
26 JUNIPER BEACH SW
28 FREELAND NW
30 LANGLEY NW
33 FREELAND SW
34 FREELAND SE
35 LANGLEY SW

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FREELAND NE, WASHINGTON

3.75 MINUTE SERIES
SHEET NUMBER 29 OF 44

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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES — FEET — KILOMETERS

INDEX TO ADJOINING 3.75 MAPS
1 DECEPTION PASS SE
5 OAK HARBOR NE
6 CRESCENT HARBOR NW
7 CRESCENT HARBOR NE

ANACORTES SOUTH SW, WASHINGTON

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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SCALE 1:12000

MILES

FEET

KILOMETERS

NORTH

QUARTER QUADRANGLE LOCATION

25	26	27
29		31
34	35	36

25 CAMANO SE
26 JUNIPER BEACH SW
27 JUNIPER BEACH SE
29 FREELAND NE
31 LANGLEY NE
34 FREELAND SE
35 LANGLEY SW
36 LANGLEY SE

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Joins sheet 26, Juniper Beach SW

Joins sheet 27, Juniper Beach SE

122° 26′15″ 48° 07′30″ 122° 22′30″

Joins sheet 30, Langley NW

Joins sheet 32, Tulalip NW

48° 03′45″ 122° 26′15″ 122° 22′30″

Joins sheet 35, Langley SW

Joins sheet 36, Langley SE

Joins sheet 37, Tulalip SW

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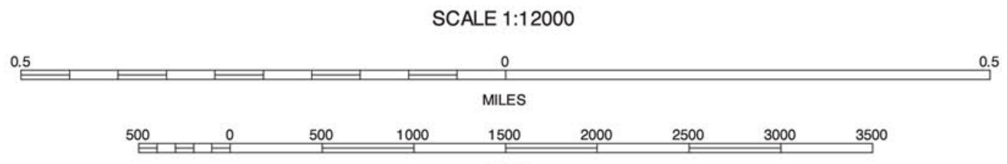
QUARTER QUADRANGLE LOCATION

SCALE 1:12000



26	27	
30		32
35	36	37

26 JUNIPER BEACH SW
27 JUNIPER BEACH SE
30 LANGLEY NW
32 TULALIP NW
35 LANGLEY SW
36 LANGLEY SE
37 TULALIP SW

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LANGLEY NE, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 31 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
TULALIP NW QUADRANGLE
SHEET NUMBER 32 OF 44

SCALE 1:12000

MILES

FEET

KILOMETERS

NORTH

QUARTER QUADRANGLE LOCATION

27			27 JUNIPER BEACH SE
31	■		31 LANGLEY NE
36	37		36 LANGLEY SE 37 TULALIP SW

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TULALIP NW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 32 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
FREELAND SW QUADRANGLE
SHEET NUMBER 33 OF 44

Joins sheet 29, Freeland NE

122° 37′30″
122° 33′45″

Joins sheet 38, Hansville NE

SCALE 1:12000

MILES

FEET

KILOMETERS

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NORTH

QUARTER QUADRANGLE LOCATION

	28	29
	■	34
		38

28 FREELAND NW
29 FREELAND NE
34 FREELAND SE
38 HANSVILLE NE

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FREELAND SW, WASHINGTON

3.75 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
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ISLAND COUNTY, WASHINGTON
FREELAND SE QUADRANGLE
SHEET NUMBER 34 OF 44

Joins sheet 28, Freeland NW

Joins sheet 29, Freeland NE

Joins sheet 30, Langley NW

Joins sheet 33, Freeland SW

Joins sheet 35, Langley SW

Joins sheet 38, Hansville NE

Joins sheet 39, Maxwelton NW

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

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NORTH

QUARTER QUADRANGLE LOCATION

28	29	30
33		35
	38	39

28 FREELAND NW
29 FREELAND NE
30 LANGLEY NW
33 FREELAND SW
35 LANGLEY SW
38 HANSVILLE NE
39 MAXWELTON NW

INDEX TO ADJOINING 3.75 MAPS

FREELAND SE, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 34 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
LANGLEY SW QUADRANGLE
SHEET NUMBER 35 OF 44

Joins sheet 29, Freeland NE

Joins sheet 30, Langley NW

Joins sheet 31, Langley NE

122° 30′00″
48° 03′45″
48° 00′00″
122° 26′15″
R. 2 E. | R. 3 E.
T. 30 N.
T. 29 N.

Joins sheet 34, Freeland SE

Joins sheet 36, Langley SE

Joins sheet 38, Hansville NE

Joins sheet 39, Maxwelton NW

Joins sheet 40, Maxwelton NE

SCALE 1:12000

MILES
FEET
KILOMETERS

NORTH

QUARTER QUADRANGLE LOCATION

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
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29	30	31
34		36
38	39	40

29 FREELAND NE
30 LANGLEY NW
31 LANGLEY NE
34 FREELAND SE
36 LANGLEY SE
38 HANSVILLE NE
39 MAXWELTON NW
40 MAXWELTON NE

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LANGLEY SW, WASHINGTON
3.75 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
LANGLEY SE QUADRANGLE
SHEET NUMBER 36 OF 44

SCALE 1:12000

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

MILES: 0.5 — 0 — 0.5

FEET: 500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500

KILOMETERS: 0.5 — 0 — 0.5

30	31	32
35		37
39	40	41

30 LANGLEY NW
31 LANGLEY NE
32 TULALIP NW
35 LANGLEY SW
37 TULALIP SW
39 MAXWELTON NW
40 MAXWELTON NE
41 MUKILTEO NW

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LANGLEY SE, WASHINGTON
3.75 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
TULALIP SW QUADRANGLE
SHEET NUMBER 37 OF 44

SCALE 1:12000

MILES

FEET

KILOMETERS

NORTH

QUARTER QUADRANGLE LOCATION

31	32	
36		
40	41	

31 LANGLEY NE
32 TULALIP NW
36 LANGLEY SE
40 MAXWELTON NE
41 MUKILTEO NW

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TULALIP SW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 37 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
HANSVILLE NE QUADRANGLE
SHEET NUMBER 38 OF 44

SCALE 1:12000

MILES

FEET

KILOMETERS

NORTH

QUARTER QUADRANGLE LOCATION

33	34	35
		39
		42

33 FREELAND SW
34 FREELAND SE
35 LANGLEY SW
39 MAXWELTON NW
42 MAXWELTON SW

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HANSVILLE NE, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 38 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 34, Freeland SE

Joins sheet 35, Langley SW

Joins sheet 36, Langley SE

Joins sheet 38, Hansville NE

Joins sheet 40, Maxwelton NE

Joins sheet 42, Maxwelton SW

Joins sheet 43, Maxwelton SE

SCALE 1:12000

MILES

FEET

KILOMETERS

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

34	35	36
38		40
	42	43

34 FREELAND SE
35 LANGLEY SW
36 LANGLEY SE
38 HANSVILLE NE
40 MAXWELTON NE
42 MAXWELTON SW
43 MAXWELTON SE

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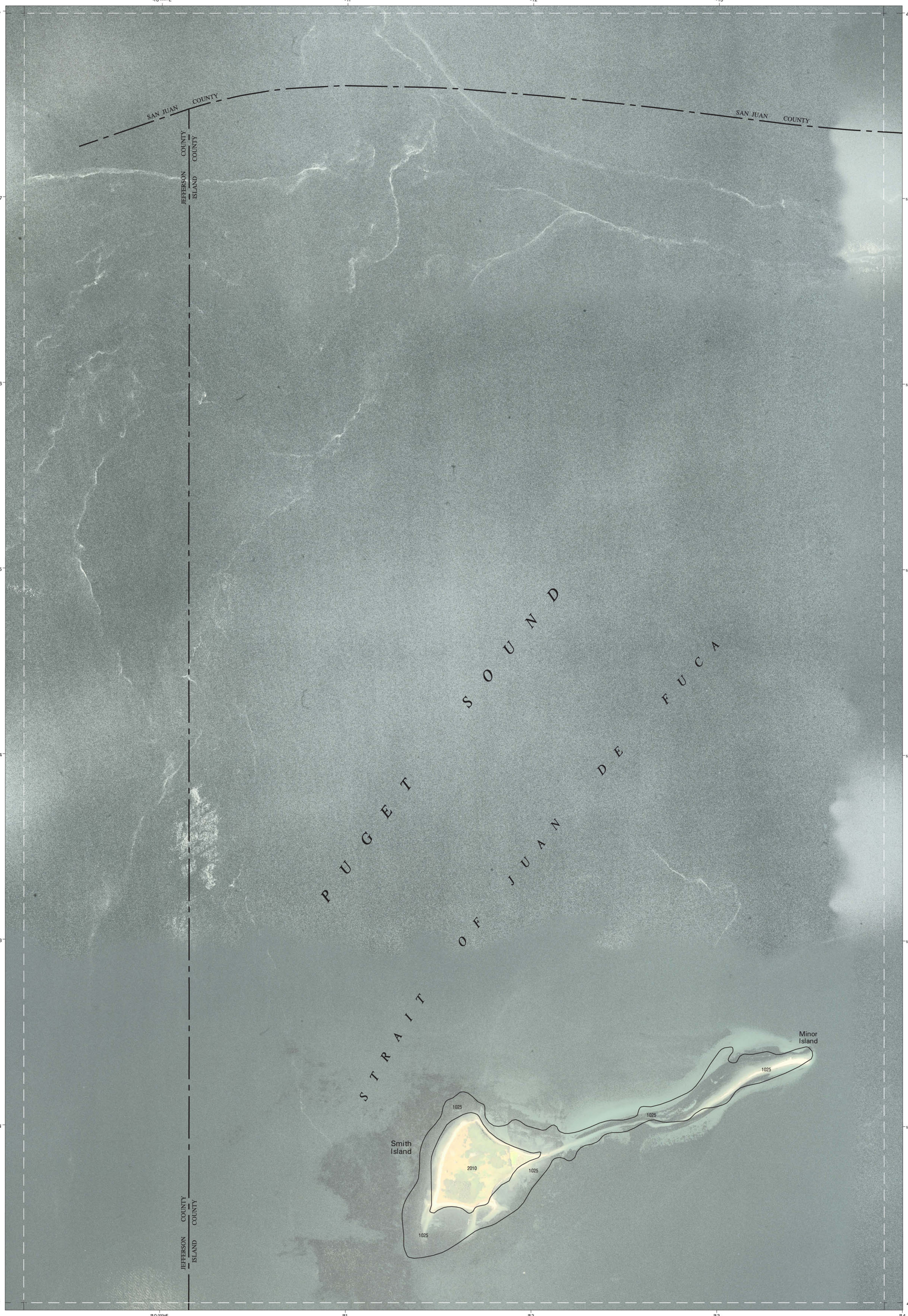
MAXWELTON NW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 39 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
SMITH ISLAND NW QUADRANGLE
SHEET NUMBER 3 OF 44



SCALE 1:12000

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Base maps are derived from orthophotographs prepared by the National Agriculture Imagery Program (NAIP), from 2006 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

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8 SMITH ISLAND SE

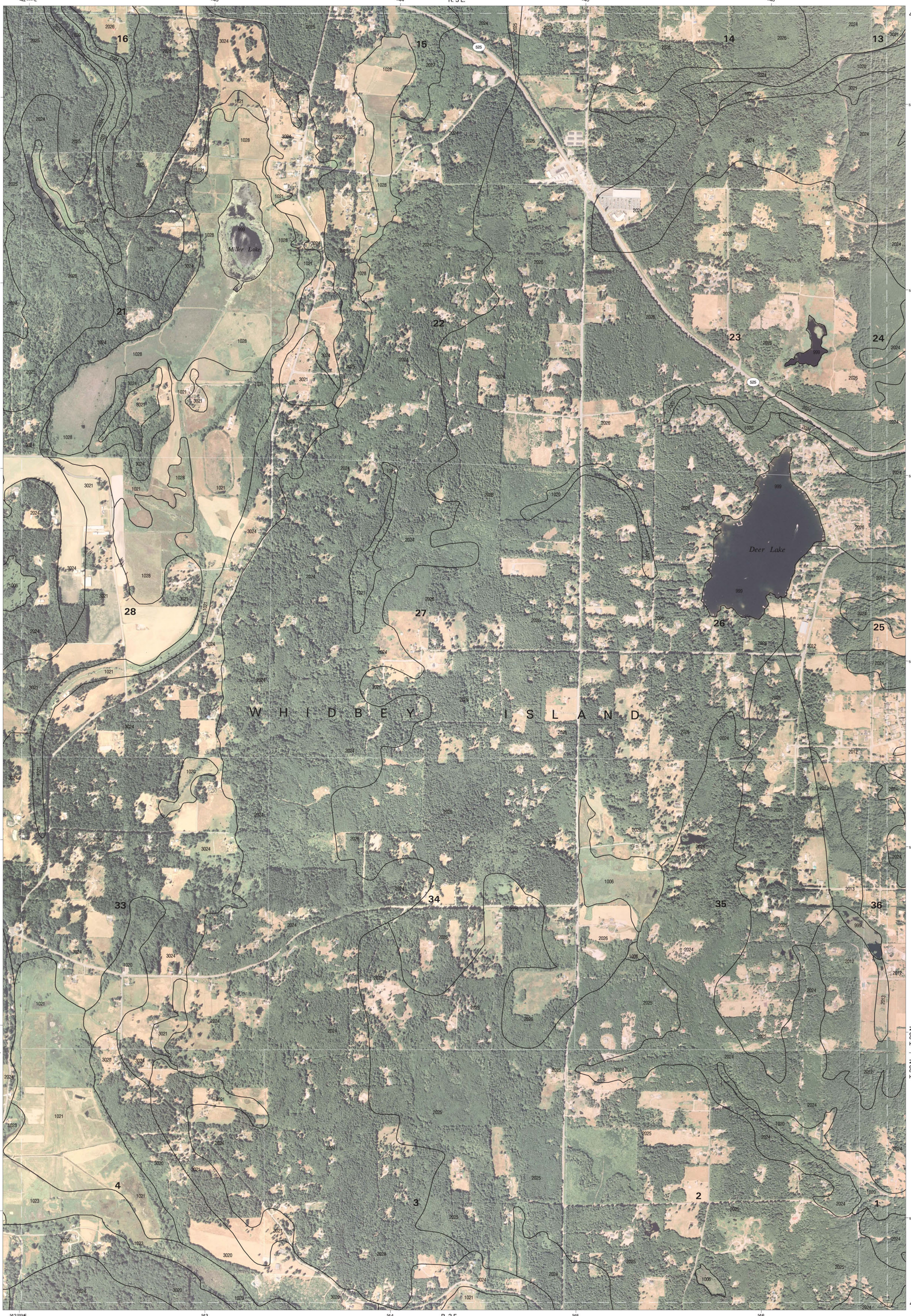
Joins sheet 8, Smith Island SE

SMITH ISLAND NW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 3 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
MAXWELTON NE QUADRANGLE
SHEET NUMBER 40 OF 44



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North American Datum of 1983 (NAD83). GRS-80 Spheroid
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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

35	36	37
39		41
42	43	44

35 LANGLEY SW
36 LANGLEY SE
37 TULALIP SW
39 MAXWELTON NW
41 MUKILTEO NW
42 MAXWELTON SW
43 MAXWELTON SE
44 MUKILTEO SW

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MAXWELTON NE, WASHINGTON
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UNITED STATES
DEPARTMENT OF AGRICULTURE
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ISLAND COUNTY, WASHINGTON
MUKILTEO NW QUADRANGLE
SHEET NUMBER 41 OF 44

SCALE 1:12000

MILES

FEET

KILOMETERS

QUARTER QUADRANGLE LOCATION

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36 LANGLEY SE
37 TULALIP SW
40 MAXWELTON NE
43 MAXWELTON SE
44 MUKILTEO SW

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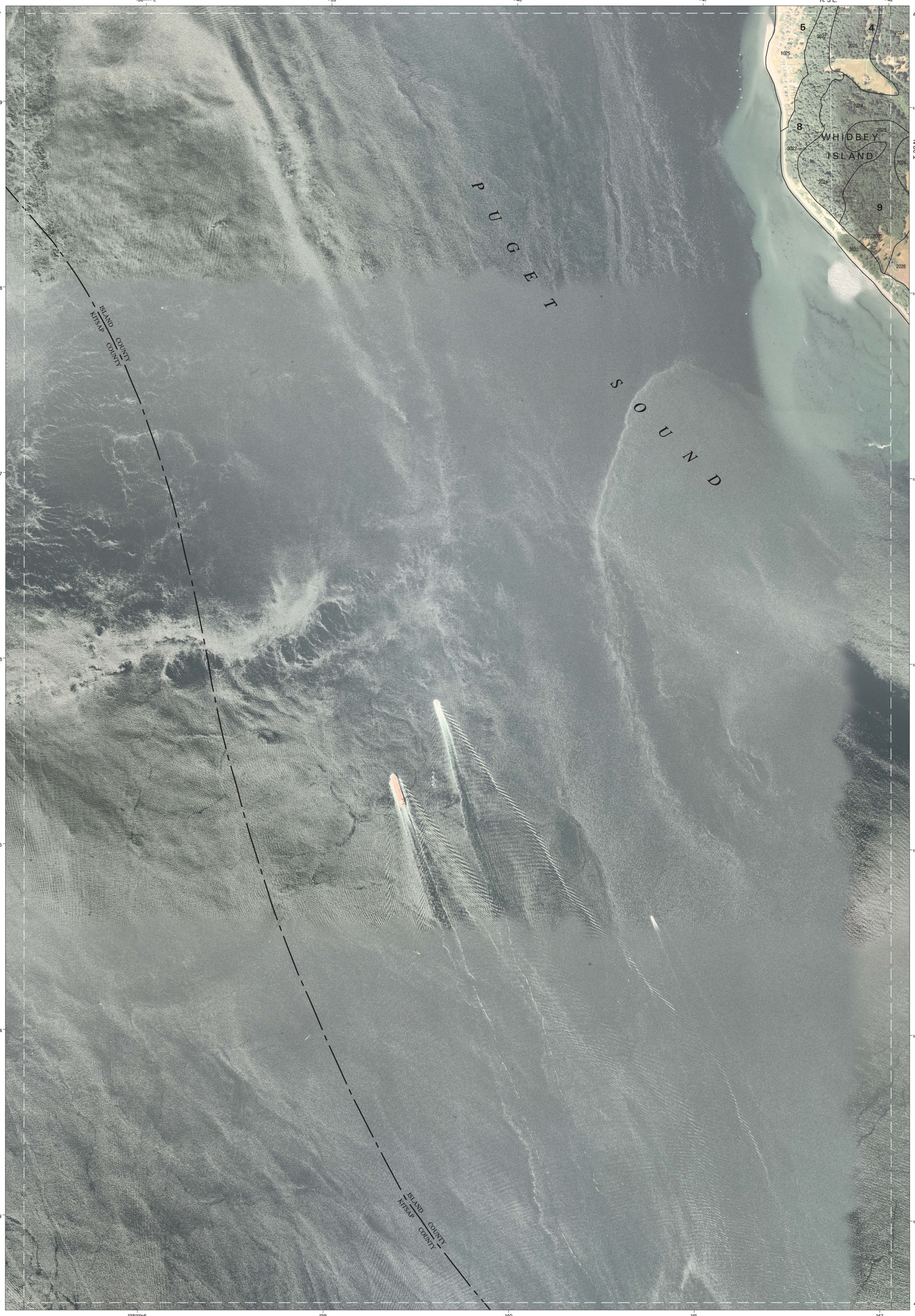
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

MUKILTEO NW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 41 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Joins sheet 38, Hansville NE
Joins sheet 39, Maxwelton NW
Joins sheet 40, Maxwelton NE
Joins sheet 43, Maxwelton SE



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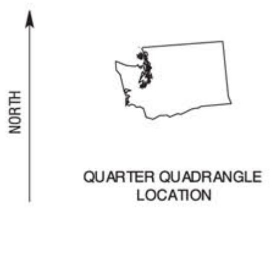
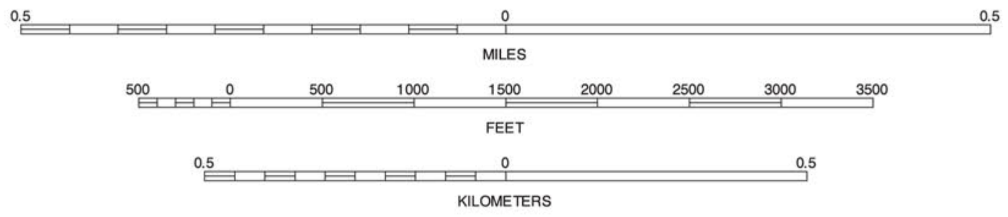
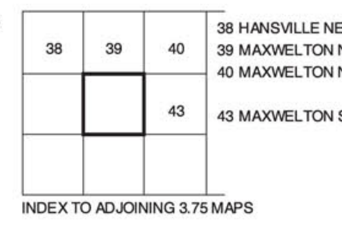
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000





MAXWELTON SW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 42 OF 44

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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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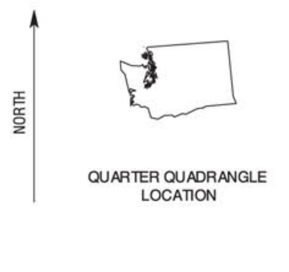
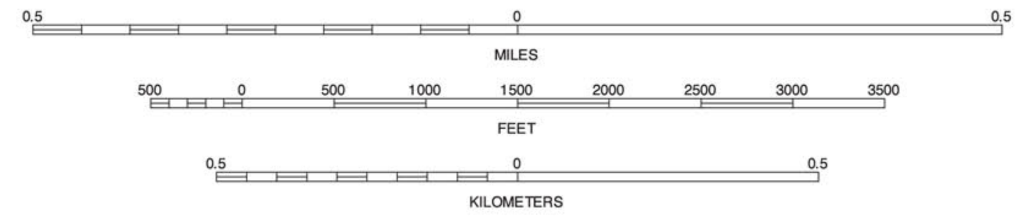


SCALE 1:12000



39	40	41
42		44

39 MAXWELTON NW
40 MAXWELTON NE
41 MUKILTEO NW
42 MAXWELTON SW
44 MUKILTEO SW

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MAXWELTON SE, WASHINGTON

3.75 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SCALE 1:12000

MILES

FEET

KILOMETERS

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 10.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

40 MAXWELTON NE
41 MUKILTEO NW
43 MAXWELTON SE

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MUKILTEO SW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 44 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 1, Deception Pass SE

Joins sheet 5, Oak Harbor NE

Joins sheet 8, Smith Island SE

Joins sheet 9, Oak Harbor SW

Joins sheet 10, Oak Harbor SE

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 — 0 — 0.5
FEET: 500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500
KILOMETERS: 0.5 — 0 — 0.5

INDEX TO ADJOINING 3.75 MAPS
1 DECEPTION PASS SE
5 OAK HARBOR NE
8 SMITH ISLAND SE
9 OAK HARBOR SW
10 OAK HARBOR SE

OAK HARBOR NW, WASHINGTON
3.75 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
OAK HARBOR NE QUADRANGLE
SHEET NUMBER 5 OF 44

Joins sheet 1, Deception Pass SE

Joins sheet 2, Anacortes South SW

Joins sheet 4, Oak Harbor NW

Joins sheet 6, Crescent Harbor NW

Joins sheet 9, Oak Harbor SW

Joins sheet 10, Oak Harbor SE

Joins sheet 11, Crescent Harbor SW

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, and cooperating agencies.
Base maps are derived from orthophotographs prepared by the National Agriculture Imagery Program (NAIP), from 2006 aerial photography.

North American Datum of 1983 (NAD83), GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 10.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 0 0.5

FEET: 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS: 0.5 0 0.5

INDEX TO ADJOINING 3.75 MAPS

1 DECEPTION PASS SE
2 ANACORTES SOUTH SW
4 OAK HARBOR NW
6 CRESCENT HARBOR NW
9 OAK HARBOR SW
10 OAK HARBOR SE
11 CRESCENT HARBOR SW

OAK HARBOR NE, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 5 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
CRESCENT HARBOR NW QUADRANGLE
SHEET NUMBER 6 OF 44

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1	2	
5		7
10	11	12

1 DECEPTION PASS SE
2 ANACORTES SOUTH SW
5 OAK HARBOR NE
7 CRESCENT HARBOR NE
10 OAK HARBOR SE
11 CRESCENT HARBOR SW
12 CRESCENT HARBOR SE

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CRESCENT HARBOR NW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 6 OF 44

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SCALE 1:12000

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NORTH

QUARTER QUADRANGLE LOCATION

MILES: 0.5 0 0.5

FEET: 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS: 0.5 0 0.5

2		
6	■	
11	12	13

2 ANACORTES SOUTH SW
6 CRESCENT HARBOR NW
11 CRESCENT HARBOR SW
12 CRESCENT HARBOR SE
13 UTSALADY SW

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CRESCENT HARBOR NE, WASHINGTON

3.75 MINUTE SERIES
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Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Joins sheet 3, Smith Island NW

Joins sheet 4, Oak Harbor NW

Joins sheet 9, Oak Harbor SW

Joins sheet 15, Port Townsend North NE

Joins sheet 16, Coupeville NW

SCALE 1:12000

MILES

FEET

KILOMETERS

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 10. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

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3 SMITH ISLAND NW
4 OAK HARBOR NW
9 OAK HARBOR SW
15 PORT TOWNSEND NORTH NE
16 COUPEVILLE NW

SMITH ISLAND SE, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 8 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
OAK HARBOR SW QUADRANGLE
SHEET NUMBER 9 OF 44

Joins sheet 5, Oak Harbor NE

Joins sheet 4, Oak Harbor NW

122° 45′ 00″ | 48° 18′ 45″ | 48° 18′ 45″ | 122° 41′ 15″

Joins sheet 8, Smith Island SE

Joins sheet 10, Oak Harbor SE

48° 15′ 00″ | 122° 45′ 00″ | 48° 15′ 00″ | 122° 41′ 15″

Joins sheet 15, Port Townsend North NE

Joins sheet 16, Coupeville NW

Joins sheet 17, Coupeville NE

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North American Datum of 1983 (NAD83), GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 10.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 0 0.5

FEET: 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS: 0.5 0 0.5

	4	5
8		10
15	16	17

4 OAK HARBOR NW
5 OAK HARBOR NE
8 SMITH ISLAND SE
10 OAK HARBOR SE
15 PORT TOWNSEND NORTH NE
16 COUPEVILLE NW
17 COUPEVILLE NE

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OAK HARBOR SW, WASHINGTON
3.75 MINUTE SERIES
SHEET NUMBER 9 OF 44

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

Soil Survey of Island County, Washington

CD-ROM Version 2010

Welcome! This CD contains information about the soils of Island County, Washington. Click on a subject of interest or browse the CD to view the files.

Soil Survey Manuscript

This document contains general information about the survey area, the general and detailed soil map unit descriptions, the taxonomic unit descriptions, and the soil properties tables.

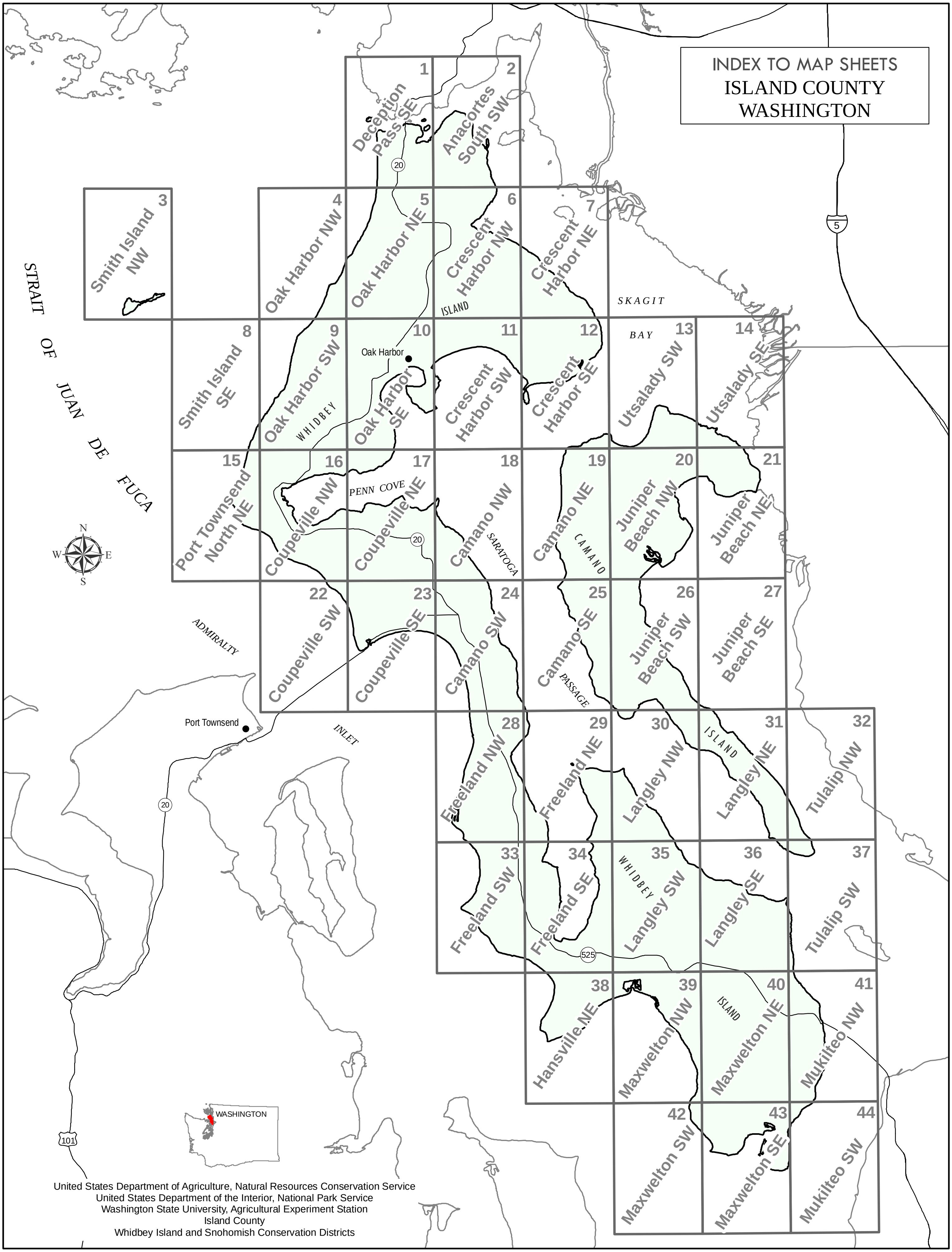
General Soil Map

The general soil map shows the survey area divided into groups of associated soils called general soil map units. This map is useful for planning the use and management of large areas. Click on the general soil map unit names in the legend to view the map unit descriptions.

Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas. From the Index to Map Sheets, click on any quadrangle to view the soil delineations and map unit symbols in the survey area. For instructions on printing the maps, click here. For instructions on split-screen viewing, click here.


GENERAL SOIL MAP
ISLAND COUNTY, WASHINGTON
United States Department of Agriculture, Natural Resources Conservation Service
United States Department of the Interior, National Park Service
Washington State University, Agricultural Experiment Station
Island County
Whidbey Island and Snohomish Conservation Districts
DECEPTION PASS
STRAIT OF JUAN DE FUCA
SMITH ISLAND
AULT FIELD
SKAGIT BAY
WHIDBEY ISLAND
OAK HARBOR
CRESCENT HARBOR
PENN COVE
COUPEVILLE
LIVINGSTON BAY
CAMANO ISLAND
PUGET SOUND
SARATOGA PASSAGE
PORT SUSAN
HOLMES HARBOR
LANGLEY
USELESS BAY
GENERAL SOIL MAP UNITS
These units are described in the text under the heading "General Soil Map Units"
1 Soils in valleys, drainageways, and depressions
2 Lowland soils on gently sloping glaciomarine drift plains
3 Altered soils
4 Upland soils on gently sloping glacial drift plains
5 Sandy soils on hills and ridges of striated outwash plains
6 Upland soils on hillslopes and ridges of glacial drift plains
7 Upland soils on dry, south-facing hillslopes and ridges of glacial drift plains
8 Prairie soils
9 Soils on bedrock hills
Water
LOCATION OF SURVEY
WASHINGTON
N
W
E
S
0 2 4 6 8 10 Kilometers
0 2 4 6 8 10 Miles
This map is designed at a scale of 1:70,000. 1 inch equals approximately 1.10 miles when printed at a size of 24"x 36".
This is a soil map that displays general soil association units. It was developed using soils information produced by the USDA - NRCS. The hillshade is derived from LiDAR data provided by the Puget Sound LiDAR Consortium. Feature names, hydrography, and cities were derived from United States Geological Survey Digital Raster Graphs and were edited to conform with features reperesented on the map or to enhance the clarity of the soils information.
GCS North American 1983
D_North_American_1983
GRS_1980
Coordinate grid ticks are approximately positioned.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9 Oak Harbor SW
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11 Crescent Harbor SW
12 Crescent Harbor SE
13 Utsalady SW
14 Utsalady SE
15 Port Townsend North NE
16 Coupeville NW
17 Coupeville NE
18 Camano NW
19 Camano NE
20 Juniper Beach NW
21 Juniper Beach NE
22 Coupeville SW
23 Coupeville SE
24 Camano SW
25 Camano SE
26 Juniper Beach SW
27 Juniper Beach SE
28 Freeland NW
29 Freeland NE
30 Langley NW
31 Langley NE
32 Tulalip NW
33 Freeland SW
34 Freeland SE
35 Langley SW
36 Langley SE
37 Tulalip SW
38 Hansville NE
39 Maxwelton NW
40 Maxwelton NE
41 Mukilteo NW
42 Maxwelton SW
43 Maxwelton SE
44 Mukilteo SW
STRAIT OF JUAN DE FUCA
ADMIRALTY INLET
SKAGIT BAY
SARATOGA PASSAGE
PENN COVE
WHIDBEY ISLAND
CAMANO ISLAND
Oak Harbor
Port Townsend
WASHINGTON
N
S
E
W
20
5
101
525
United States Department of Agriculture, Natural Resources Conservation Service
United States Department of the Interior, National Park Service
Washington State University, Agricultural Experiment Station
Island County
Whidbey Island and Snohomish Conservation Districts

SOIL LEGEND

994—Urban land
995—Water, miscellaneous
996—Dumps
997—Pits, gravel
998—Water, saline
999—Water, fresh
1005—Shalcar muck, 0 to 2 percent slopes
1006—Semiahmoo muck, 0 to 2 percent slopes
1016—Orcas peat, 0 to 2 percent slopes
1017—Zylstra-Frostad complex, 0 to 3 percent slopes
1018—Coupeville-Mitchellbay complex, 0 to 5 percent slopes
1019—Morancreek, cool-Limepoint complex, 0 to 5 percent slopes
1020—Sholander-Limepoint complex, 0 to 8 percent slopes
1021—Sholander, cool-Spieden complex, 0 to 5 percent slopes
1022—Coveland loam, cool, 0 to 5 percent slopes
1023—Coupeville loam, cool, 0 to 3 percent slopes
1024—Limepoint-Sholander, cool, complex, 0 to 5 percent slopes
1025—Beaches-Endoaquents, tidal-Xerorthents association, 0 to 5 percent slopes
1026—Coveland loam, prairie, 0 to 5 percent slopes
1027—Coupeville loam, prairie, 0 to 3 percent slopes
1028—Orcas peat, drained, 0 to 2 percent slopes
1051—Coupeville-Ebeys complex, 0 to 5 percent slopes
1052—Ebeys-Coupeville complex, 0 to 5 percent slopes
1053—Dugualla muck, 0 to 2 percent slopes
1054—Puget silty clay loam, 0 to 2 percent slopes
1055—Urban land-Coupeville-Coveland complex, 0 to 5 percent slopes
2000—Whidbey gravelly loam, 3 to 15 percent slopes
2010—Whidbey-Hoypus complex, 2 to 15 percent slopes
2012—Elwha-Zylstra-Morancreek, cool, complex, 2 to 12 percent slopes
2013—Zylstra-Frostad complex, 0 to 8 percent slopes
2016—Zylstra-Alderwood complex, 3 to 30 percent slopes
2017—Bozarth-Pilepoint complex, 2 to 8 percent slopes
2018—Sucia loamy sand, cool, 2 to 10 percent slopes
2019—Mitchellbay gravelly sandy loam, 2 to 10 percent slopes
2023—Sucia-Sholander complex, cool, 2 to 15 percent slopes
2024—Indianola-Uselessbay complex, 5 to 30 percent slopes
2025—Utsalady-Uselessbay complex, 2 to 12 percent slopes
2026—Uselessbay-Utsalady complex, 0 to 10 percent slopes
2027—Utsalady-Uselessbay complex, 0 to 5 percent slopes
2052—Townsend-San Juan complex, 3 to 15 percent slopes
2054—Zylstra-Mitchellbay complex, 0 to 5 percent slopes
2055—Zylstra-Mitchellbay complex, 2 to 10 percent slopes
3001—Hoypus sandy loam, 3 to 25 percent slopes
3003—Keystone-Utsalady complex, 0 to 3 percent slopes
3005—San Juan sandy loam, 2 to 8 percent slopes
3007—San Juan sandy loam, 5 to 20 percent slopes
3008—Xerorthents-Endoaquents, tidal association, 0 to 100 percent slopes
3011—Everett-Alderwood complex, 0 to 5 percent slopes
3017—Everett-Alderwood complex, 3 to 15 percent slopes
3018—Everett sandy loam, 15 to 40 percent slopes
3019—Everett-Alderwood complex, 15 to 40 percent slopes
3020—Indianola loamy sand, 8 to 25 percent slopes
3021—Indianola loamy sand, 0 to 5 percent slopes
3022—Aquic Dystroxerepts-Oxyaquic Xerorthents complex, 15 to 70 percent slopes
3024—Indianola loamy sand, 3 to 15 percent slopes
3050—Hoypus sandy loam, 2 to 8 percent slopes
3051—Snakelum sandy loam, 0 to 2 percent slopes
3052—Everett-Hoypus association, 8 to 40 perent slopes
3053—Bozarth-Ebeys complex, 0 to 12 percent slopes
3054—Hoypus sandy loam, 0 to 3 percent slopes
5000—Cady-Rock outcrop complex, 5 to 30 percent slopes
5001—Rock outcrop-Haro complex, 25 to 75 percent slopes
5003—Doebay-Morancreek complex, 5 to 25 percent slopes
5006—Cady-Rock outcrop complex, 25 to 75 percent slopes
5007—Haro-Hiddenridge-Rock outcrop complex, 5 to 30 percent slopes
5015—Doebay, moist-Cady-Rock outcrop complex, 10 to 30 percent slopes

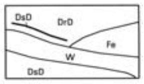
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ISLAND COUNTY, WASHINGTON
WA 029

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

SOIL SURVEY FEATURES

SOIL DELINEATIONS AND LABELS



ROAD EMBLEMS

Interstate

Federal

State

Other

CULTURAL FEATURES

National, state or province

County or parish

Reservation (national or state forest or park)

Limit of soil survey (label)

Public Land Survey System Section Boundary